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15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

CHRONOLOGICAL AND DESCRIPTIVE INDEX

OF

PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING

THE ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

For the Year 1875.

Printed and Published by Order of the Commissioners of Patents,

UNDER THE

ACT of 15 & 16 VICTORIÆ, Cap. 83. Sec. XXXII.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
PUBLISHED AT THE OFFICE OF THE COMMISSIONERS
OF PATENTS FOR INVENTIONS,
SOUTHAMPTON BUILDINGS, HOLBORN.
1876.

PREFACE.

PREVIOUS to the year 1867 the Abridgments of Specifications were published in classes only; and after the publication of the first volume of a class, bringing the Abridgments down to a particular date, considerable time necessarily elapsed before the appearance of the second part or continuation of the class. To obviate the inconvenience thus occasioned, the Commissioners of Patents made the following rule :—

> After the 31st day of December 1866, every applicant for Letters Patent shall deliver at the Office of the Commissioners, with his provisional specification, or (when a complete specification is filed with the petition and declaration) with his complete specification, an abridgment, in duplicate, under his hand or the hand of his agent, of such provisional or complete specification. The abridgment must set forth the name of the applicant, the title of the invention, and describe, in as short a manner as possible, the features of novelty which constitute the invention. The abridgment and the copy thereof must be written upon sheets of foolscap paper, and upon one side only of each page, leaving a margin of one inch and a half on the left-hand side of the page.

The Commissioners also directed that the Abridgments so delivered should be printed and published in the following manner, as explained in their Report to Parliament for the year 1866 :—

> " These abridgments will be printed and published in quarterly volumes after the expiration of " the six months' protection. Thus the abridgments delivered at the office in the quarter ending " 31st March will be ready for printing in the quarter ending 30th September, and the volume will " be published in the ensuing quarter. The volumes will be of the same size as the chronological, " alphabetical, and subject-matter indexes (imperial 8vo.), and constitute in fact a fourth kind of " index, viz., a descriptive index in a chronological form. It is also intended to publish these " abridgments from time to time in classes, according to the plan which has been in operation from " the year 1856."

The publication of the Descriptive Index accordingly commenced in 1867. In the volumes for the years 1867 and 1868, the correct title of the Invention is prefixed to each Abridgment, and also the name of the communicator, when the invention has been communicated from abroad, and a notice if Letters Patent have not been granted or are void for want of a Final Specification. The Abridgment itself is printed exactly as furnished by the applicant for Letters Patent; no attempt being made to correct errors in spelling or grammatical construction, or to supply words which have been omitted (except in cases where the words omitted from the original Abridgment are to be found in the copy).

In the volume of this Index for the year 1869, all the information previously furnished in a separate form by the Chronological Index was given (as well as an Alphabetical Index of Names); the title was changed to "Chronological and Descriptive Index of " Patents applied for and Patents granted;" and the Chronological Index ceased to appear as a distinct publication.

In consequence of the receipt of a memorial signed by a large number of patentees, manufacturers, and literary and scientific men, the Commissioners of Patents decided that the Abridgments delivered after the 1st January 1871 should be published weekly (instead of quarterly), with Indexes of Persons and Subjects. The Chronological and Descriptive Index for 1871, with Indexes of Names and Subject-matter, accordingly commenced in a weekly form on the 14th July 1871. The Indexes for the years 1872, 1873, 1874, and 1875 have been printed and published in like manner. The notices which were prefixed to the Abridgments in cases where Letters Patent had not been granted or were void for want of a Final Specification have been discontinued, as, on account of the early publication of the Abridgments, the information could not in every case be given; but this information will be found in the copies of the Specifications which are subsequently printed. In the body of the work the Abridgments of the Provisional and Complete Specifications are published in regular numerical order in the week after the expiration of the term of *six months* from *the date of application*. But each weekly number has an appendix, containing the Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications just received. These Abridgments are subsequently printed in the body of the work in their proper places, in order to preserve the numerical and chronological arrangement of the book. The Indexes of Names and Subject-matter refer to the Abridgments in the appendixes, as well as to those in the body of the work. In the indexes of each successive number for the years 1871, 1872, and 1873 all the previous indexes were incorporated until the end of the year, and then with the last No. [52] the complete Alphabetical and Subject-matter Indexes for the year were published, to be bound with the fifty-two weekly parts in one volume. This practice has been also followed with the Subject-matter Indexes for the years 1874 and 1875, but with the Indexes of Names only to the publication of the 31st No., when the Alphabetical Index for the whole year was published. The appendixes are not to be bound with the volume, as the Abridgments which they contain ultimately appear in the body of the work.

H. READER LACK.

July, 1876.

CHRONOLOGICAL AND DESCRIPTIVE INDEX
OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 1 to January 2, 1875.

A.D. 1875, January 1.—No. 1.

STORMONT, James Glazebrook, residing at 59, Constitution Hill, Birmingham, in the county of Warwick, machinist and brassfounder.—"An improved call-bell and actions used in call and other "bells."

My invention relates to an improved configuration of the parts of call-bells, and to an improved arrangement of springs, levers, and other appliances, whereby a bell may be struck several times by one pressure of the hand or finger.

A.D. 1875, January 1.—No. 2.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Celestin Martin, a person resident at Verviers, in the Kingdom of Belgium.*)—"Improvements in "machines for carding, combing, and spinning wool and other fibrous materials in general."

The invention consists of a sort of endless metallic table, the links of which carry toothed blades, which conduct the nap of wool or other materials to be carded, combed, or spun between the comber or doffer and the continue, and also of a reservoir under the said endless table filled with any liquid serving to moisten the said material.

A.D. 1875, January 1.—No. 3.

WISE, William Lloyd, of Chandos Chambers, Adelphi, in the county of Middlesex.—(*A communication from Claude Levet, of Montceau, in the Republic of France.*)—"Improvements in machinery or apparatus for drilling, boring, or cutting rock or other hard substances."

In rock drilling apparatus as heretofore usually constructed, great difficulty has been experienced from excessive wear and tear of the parts whereby the drilling or boring tool has been rotated.

Now this invention is designed to obviate the evils referred to, and to reduce to a minimum the extent of movement friction and consequent wear of the parts, whereby the operation of rotating the drilling or boring tool is performed; and furthermore to effect in a simple manner, without shock, the necessary movements of the valve which governs the admission and emission of compressed air or actuating fluid to and from the respective ends of the cylinder.

For these purposes, the partial rotations of the drilling or boring tool are effected by the operation upon ratchet teeth on the piston rod of a catch contained in a ring or collar carried by an arm working about a fixed centre.

A valve is sometimes combined with the fulcrum of the arm above mentioned, so that as the arm moves to and fro it shall communicate to the valve the necessary movements for governing the admission and emission of compressed air or actuating fluid to and from the respective ends of the cylinder.

A.D. 1875, January 1.—No. 4.

WILCKE, Henry, of 3, Crown Villas, Greengate Street, Plaistow, in the county of Essex, engineer.—"Improvements in the propulsion of screw steam ships."

One or more propellers with blades whose action or range extends below the keel or bottom of the ship, and in combination therewith one or more shallow propellers that is to say with blades not extending to so deep a range. The intention is to work the first or deep propellers in deep water, either with or without the shallow propellers, and to work the shallow propellers without the deep ones when in shallow water.

A.D. 1875, January 1.—No. 5.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Daniel Seymour Silcox, of Charleston, South Carolina, United States of America, gentleman.*)—" Improved materials for kindling fires."

This invention relates to materials for kindling fires, and consists in applying a combustible coating to ordinary coal, coke, charcoal, or charred wood, or fossil coal, or any material of an analogous nature.

A.D. 1875, January 1.—No. 6.

HUNT, Edmund, of Glasgow, in the county of Lanark, North Britain, patent agent.—(*A communication from Mason Johnston Matthews, residing at Boston, Massachusetts, United States of America.*)—" An " improved musical instrument."

This invention relates to an improved musical instrument in which there is combined with the usual parts of any suitable known variety of the harmonium or American organ, a distinct action, comprising percussive and checking details with a special resonance box acting in connection with a series of plates or musical vibrators of steel or other suitable metal. The tones produced by this added combination of parts resemble those of the harp, or are between those of the harp and those of the pianoforte; and they blend well with those of the harmonium or organ, with which the action is combined. The inventor applies to the combination the designation piano-harp cabinet organ.

A.D. 1875, January 1.—No. 7.

MILLBOURN, Carter, of No. 17, Fish Street Hill, in the city of London.—" Improvements in the " means of preventing and signalling accident to carriages of a railway train, and apparatus for that " purpose."

This invention consists in fixing at the ends of railway carriages duplicate handed brackets projecting so that when two carriages are coupled together one of the brackets of each comes over and one under those of the other carriage. Should either carriage drop by the fracture of an axle or by running off the rails, it would be supported by one of its brackets resting on a bracket of the next carriage. The brackets are provided with audible signals, such as an explosive fog signal or a bell or gong to be sounded when the brackets come violently in contact, or the brackets may be connected to continuous break gear, so that the breaks are put on when an accident occurs.

A.D. 1875, January 1.—No. 8.

TILDESLEY, Matthew, of Tettenhall Wood, near Wolverhampton, in the county of Stafford, gentleman.—" Improvements in the construction of door bolts and other fastenings."

The first part of this invention refers to the construction of door bolts. The plate is formed by placing edge to edge two strips of iron. Cross-pieces are placed at suitable positions along the plate. The staples are formed of double thickness, and with rivets and shouldering for connection. The rivets pass through openings formed through the cross-pieces and strips, and are rivetted up at the back of the strips. One staple is placed at the back of the bolt or rod to form a stop. The cheeks are formed of double thickness by bending the iron back on itself. Rivets and shoulderings at the opposite ends to where the iron is bent secure the cheeks to the bolt plate. The loose staple is formed the same as the other staples and rivetted to a plate of double thickness. The screws for attachment are passed through the cross pieces for the bolt plate and through the double plate for the loose staple. The bolt or rod is formed hollow, and filled with plaster of paris or other cement. The knob is rivetted into the bolt or rod.

The barrel for a barrel-bolt is formed of one or more strips placed longitudinally and retained by two of the staples.

The second part refers to the construction of shuts, bolts, tumblers, levers, rims, and inside and outside plates for door latches and locks, and like articles. The said bolt or other article is built up of separate pieces of iron, which are afterwards either welded or rivetted together.

The third part refers to the construction of hinges. The hinges are formed of iron two or more pieces in thickness bent back on itself and welded or rivetted together.

By this invention the inventor is able to use old bale ties and other narrow scrap iron.

A.D. 1875, January 1.—No. 9.

FISH, William Stebbins, of Mystic, in the county of New London and state of Connecticut, United States of America, but at present residing in Glasgow, in the county of Lanark, North Britain.—"A "new or improved compound material applicable for packing stuffing boxes of engines, pumps, and "other mechanism, for packing joints of pipes, boilers, tanks, cylinders, and valve chests, and others "analogous thereto, and which is also applicable for covering floors, roofs, and other surfaces."

The feature of novelty which constitutes this invention is the new or improved compound or material and the use or employment of the said compound or material for the several purposes set forth.

A.D. 1875, January 1.—No. 10.

FOSTER, William Robert, of 87, Grange Road, Bermondsey, india rubber manufacturer.—"An "improved railway brake."

The employment of hydraulic or air-pumps, to the piston-rods of which are fixed shoes which will press down on the rails and lift the carriages.

A.D. 1875, January 1.—No. 11.

BONNER, John, of Coventry, in the county of Warwick, blacksmith.—"Improvements in elastic "web looms and other weaving machinery."

The invention relates to improvements in elastic web looms and other weaving machinery, in order to facilitate and regulate the gauge and take up motion from time to time as required, any regulated number of shoots to the inch being thereby insured.

The improvements also consist in the use of regulating studs working in the slots of two sliding bars, which studs can be set at any required distance to regulate the gauge of the work in progress.

A.D. 1875, January 1.—No. 12.

PERRY, Joseph John, of Red Lion Square, in the county of Middlesex, and **JONES, Ralph Augustine**, of Brill, in the county of Buckingham.—"Improvements in means for lighting cigars and other "articles, and for obtaining light for other purposes."

The invention consists in forming a holder with a sliding piece having a spring mouth or a fork to hold a short match, vesuvian, vesta, or other light.

A.D. 1875, January 1.—No. 13.

BEATTIE, Robert, mechanic, and **BLAIR, Robert**, joiner, both of Belfast, in the county of Antrim, in Ireland.—"Improvements in sewing machines."

This invention consists in the use of a plate carrying the needle arm and shuttle box, and shifting them together in the several directions so as to produce the french vein or hem stitch and other fancy work.

Also the use of a perforated plate attached to the shuttle box to support the cloth or fabric.

Also the use of a bent or curved and slotted bar or plate swinging from the needle box and acted on by a pin on the needle bar to regulate the tension of the thread.

And also the use of a plate or band to maintain the fold of the cloth or fabric.

The countershaft is driven by wheel cams and rollers instead of gearing, but may be driven by gearing.

A.D. 1875, January 1.—No. 14.

FENTON, William, and **FENTON, John**, of Liversedge, in the county of York, and **NEWSOME, Christopher Hutchinson**, of Birstal, near Leeds, in the aforesaid county of York.—"Improvements "in machinery or apparatus for carding, gilling, and roving worsted, silk, flax, cotton, and other "fibres."

In the employment of a machine similarly constructed to the carding engine, with rings of cards or narrow widths of card clothing at equal distances apart, placed around the various rollers forming the machine. The wool, cotton, or other fibre is then drawn or stripped off the "doffer cylinder" by combs or gills, and thence forward by rollers to be wound onto bobbins by means of flyers and spindles, one spindle and bobbin being applied to each ring of cords.

A.D. 1875, January 1.—No. 15.

WAUGH, James, of Glasgow, in the county of Lanark, North Britain.—"Improvements in closing "and opening bottles containing gaseous or effervescing liquids, and in the means employed "therefor."

The features of novelty which constitute this invention are the means for closing and opening bottles.

A.D. 1875, January 1.—No. 16.

RHODES, Benjamin, and **RHODES, Thomas Brown**, both of Armley, near Leeds, in the county of York.—"Improvements in machinery for flocking woollen or other woven or felted fabrics."

The confining spout is made much shorter than usual, so that the spout and throat are brought much closer together, and the heat is thus kept in the material. The material is enclosed within suitable partitions. In combination with the above an apparatus for distributing the flocks is used, having a perforated bottom and spiked roller for shaking the flocks through the perforated bottom; there is a door at side to get out long flocks which clog up the spiked roller.

A.D. 1875, January 1.—No. 17.

FIELDEN, Immer, of the city of Glasgow, in the county of Lanark, North Britain, engineer.—"Improvements in steam engines."

The nature and novelty of this invention consist in making the motive cylinders of reciprocating steam or other motive fluid engines (either of the high or low pressure class) with moving ends, in lieu of the usual fixed bottoms or covers, for the purpose of automatically following up the motion of the piston from each end for some distance, so as to shorten the cylinder on the acting side before admitting the motive fluid, and cause it to act at once with full force on the piston when the crank is at a considerable angle on either side of the dead plumb centre line. Various modes may be adopted of fitting the ends of the cylinders of engines that they may be moved automatically, by an arrangement of mechanism primarily actuated from the crank shaft or other continuous acting part of the engine. Under one mode a screw with a coarse pitch may be cut on the periphery of the moving ends of the cylinder, and fitted into the ends thereof with a packing ring, so that by turning either end through a stud joint it would be secured into or out of the cylinder as desired, to give the length of motion required by the arm of the lever connected to it by a connecting rod and universal joint. Or these ends might be turned by toothed gearing or cam mechanism; but when the lever is used it might be of the bell crank form, and have its short arm actuated by a vertical reciprocating rod connected to it above and working in guides below, and having a stud roller on its lower end working in a cam groove fixed on the crank shaft. The steam is admitted, when the end cover has stopped its inward motion, along with the piston, through ports (entering the cylinder at equal distances from its extreme ends) having ordinary valves to steam and cut off and expand to the shortened end of the effective acting stroke of the piston. Instead of the screw for sustaining the re-action of the steam on these moving ends, these might be reciprocated by a cam motion direct from the crank shaft, and released by any convenient arrangement of locking and unlocking mechanism acted simultaneously by a separate cam, actuated from any moving part of the engine.

A.D. 1875, January 1.—No. 18.

BOUSFIELD, George Tomlinson, of Sutton, in the county of Surrey.—*A communication from David Heaton, of Providence, Rhode Island, in the United States of America.*)—"An improvement in metallic "fasteners for buttons, and in the means for the mode of attaching the same to wearing apparel."

The said invention relates to attaching buttons to wearing apparel by a metallic connection instead of sewing on the same with thread in the usual way, the object being to attach the buttons more quickly, firmly, and securely than by the old method.

A.D. 1875, January 2.—No. 19.

COLLIER, John, and HOLDING, Joseph, both of Salford, in the county of Lancaster.—" A new and " improved application to domestic 'coppers' or other similar boilers of an hydraulic circulator and " distributor."

The novelty of the invention consists in adapting to "coppers" or other similar boilers, a false bottom, which will form a lower space for containing water, which enters thereto from above through the sides where the false bottom bears upon the inner surface of the boiler; from this plate or false bottom a pipe projects to a point above the surface of the water contained in the boiler; this pipe is provided with a nozzle or rose bit, so that when the water confined in the lower space boils it is forced up the projecting pipe and enjected through the nozzle on to the upper surface of the liquor or water supplying the lower space, thus effecting, so long as the water boils, a constant circulation of the same within the boiler.

A.D. 1875, January 2.—No. 20.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Fréderic Victor Dufour, of No. 64, Faubourg St. Martin, Paris, France.*) —" An improved extirpating or grubbing and sowing machine."

This invention relates to a combination of extirpator or grubber with a sower, so that they may work together or separately.

The machine is composed of a fore-carriage so arranged that the fore wheels may be lifted to pass over obstructions; of two front and three back grubbing or extirpating teeth set so that the front and back teeth may be worked in combination or independently; of shares and harrows behind the grubbing teeth and rollers running in the rear; and of a box placed above the hind wheels to contain the seed, and having within it a horizontal axle with pinions, which set in motion by other pinions or pulleys and endless chain outside the box, push the seed so that it falls through funnels into pipes, bringing the seed into the furrows made by the teeth of the extirpator and the shares so as to be covered with earth by the rollers.

A.D. 1875, January 2.—No. 21.

SAUVÉE, Albert, of 22, Parliament Street, in the county of Middlesex, civil engineer.—(*A communication from Isaac César Charles Rolin, and Leon Joseph Guitard, both of Lyons, in the Republic of France.*)—" An improved self-acting regulator for twisting machines."

This apparatus consists in two discs placed one against the other, one being in glass and the other in metal. The glass disc has a flat surface, and the metal disc a slightly conical surface, so that there is a space between them. The silk or other material to be twisted, on leaving the bobbin passes through two holes in a box fixed on the spindle on which that bobbin revolves, and then through an eye at the end of the spindle and into the space between the discs. The finer the thread is, the deeper it goes into the space and the more it is twisted. On leaving the regulator the thread is wound on bobbins.

A.D. 1875, January 2.—No. 22.

EVANS, Phillip, and WILLIAMS, Henry, of Aberdare, in the county of Glamorgan, engine fitters.— " Improved means of and apparatus for stoppering bottles."

The improvements consist in constructing the stopper of a flat metallic plate made of a convenient size to cover the top of the neck of the bottle, and having formed on its lower or interior surface, a suitable plug or cork which enters the neck of the bottle. This plate is hinged to a wire passing round the neck of the bottle. To the opposite side of the wire is hinged a spring catch which bears over the top of the neck of the bottle, and keeps the stopper plate securely down in position until it is released by pressure of the finger applied to it at its lower end, when the contents of the bottle are allowed to flow out.

A.D. 1875, January 2.—No. 23.

BROWNING, John, of 63, Strand, London, optician.—"Improvements in latches or fastenings for "doors, casements, and shutters."

This invention consists in a latch with two slots working on two pins one on the jamb, the other on the door; to the one slot is given a diagonal direction, so that on an attempt being made from the outside to lift the latch it slides forward and becomes locked in another part of the slot, and the upward movement is prevented.

A.D. 1875, January 2.—No. 24.

MILLER, William Reynolds, of the city of Baltimore, in the county of Baltimore, state of Maryland, United States of America.—"Improvements in pianos and similar musical instruments."

My invention has for its object to destroy the conductivity of sound in legs of pianos and other similar musical instruments, and to this end the nature of my invention consists, first in the interposition of an insulator or non-conductor of sound between the top of the leg and the piano-case; second, in various modes of arranging such insulator or non-conductor of sound.

A.D. 1875, January 2.—No. 25.

STRINGFELLOW, Henry William, of Folkestone, in the county of Kent, surveyor.—"Improve- "ments in the manufacture of drain pipes."

To reduce the cost of drain pipes I propose to mould them in portland cement with or without an admixture of sharp grit according to their sectional capacity, and I thus obtain pipes impermeable to moisture.

A.D. 1875, January 2.—No. 26.

JENSEN, Peter, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from the Hamburg American Sewing Machine Company, late Pollack, Schmidt, and Company, Hamburg.*)—"Im- "provements in printing on and ornamenting tinned or other metallic plates."

Impressions are made on stone and thence printed off on to prepared paper, which is then along with the tin plate passed through rollers. After being heated in an oven and varnished with a peculiar solution the plates are again exposed to heat in another oven.

A.D. 1875, January 2.—No. 27.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Malcolm McVicar, of Potsdam, New York, United States of America, and Donald Harvey McVicar, of Montreal, Canada.*)—"Improvements in apparatus for teaching in "schools."

This invention relates to improvements in apparatus for teaching in schools; and it consists in a frame having a suitable opening through its centre for exposing cards or objects to view, upon each side of which are arranged a set of independent slide-bars, which can be so arranged that either set will entirely or partially hide the object or card from view. Sliding in grooves back of this opening and two sets of slide bars is a card frame made of slats with spaces between them. An object frame also composed of slats with spaces between them is used independently or is attached to the main frame.

A.D. 1875, January 2.—No. 28.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Eugène Paul Emile Portait and Charles Philippe Weber, trading under the name of Portait, Weber, and Company, of Paris, France.*)—"Improvements in machinery for preparing cotton "and other fibrous substances for spinning."

The invention relates to machinery for drawing out, laying parallel, and dressing the fibres of all kinds of filamentous materials, and consists essentially in an arrangement of nippers having a to and fro motion by which the fibres are seized and drawn out on the receding motion of the nippers, the latter then returning open to repeat the operation.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from June 26 to July 2, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, January 4.—No. 35.

NAIRN, Michael Barker, of Kirkcaldy, Scotland.—" Improvements in machinery for preparing " floor cloths for printing."

The object of this invention is to facilitate the trowelling or applying paint to the surface of cloth and the subsequent drying and rubbing of such cloth to prepare it for printing.

A.D. 1875, January 4.—No. 39.

WAVISH, James, of East India Road, in the county of Middlesex.—" Improvements in apparatus " for facilitating the proper combustion of fuel."

This invention consists in the employment of a central tube or air admitting chamber to fireplaces, and also in the employment of a chamber through which air is admitted to the sides of the fuel.

A.D. 1875, January 5.—No. 45.

BOIS, Alexis, of Brussels, in the Kingdom of Belgium, civil engineer.—" An improved guard or " safety apparatus applicable to tramway cars and other vehicles."

This invention consists in covering or enclosing entirely or partially by one or more guards or safety apparatus the wheels of tramway cars and other vehicles and the space between the frame of such vehicles and the rails to prevent accidents to passengers or others falling or being thrown down in the path of the said vehicle. The said guard or safety apparatus consists of a shield of sheet metal, or a grating of iron or other bars, or a trellis or net work of wire or other material affixed to a metal or other frame shaped for the purpose; the guard or safety apparatus is mounted upon or suspended to the axles of the wheels or by preference to the axle boxes of the said wheels, in which latter case the axle boxes are provided with friction rollers grooved or flanged upon which vertical slides or slots in the guard frame fit, so as to allow a certain amount of play below the lower rollers. If preferred, the friction rollers may be mounted on the guard frame, and the slots or slides made in or on the axle boxes or sliding pieces on the axle boxes or on the guard frame, may work in slides in the guard frame or axle box, or the frame may be connected to each of the axle boxes by rods adjusted as in an ordinary link motion.

The lower edge of the guard is provided with wheels, and apertures closed by doors may be made in different parts of the said guard.

A.D. 1875, January 12.—No. 118.

BRITTEN, Frederick James, and BARRON, William Samuel, both of 21, Buttesland Street, in the county of Middlesex.—" Improvements in centrifugal apparatus."

The basket of the apparatus is fixed on a vertical axis which has at its upper end a ball or hemisphere. This ball rests in a cup fixed at the end of a tubular axis surrounding the above named axis. The basket and its axis are thus suspended from the cup. The machine is driven by causing the tubular axis to revolve.

A.D. 1875, January 15.—No. 161.

ROGERS, Henry, of the firm of Henry Rogers, Sons, and Company, of Wolverhampton, in the county of Stafford, merchants.—(*A communication from Henry Mullholland, of Montreal, Canada.*)—"Improvements in chisel pointed cut nails, and in machines for the manufacture of the same."

According to this invention the chisel pointed cut nails are formed with a head by compressing or upsetting the metal at the head part of the nail, the parts of the machines for manufacturing the chisel pointed and headed cut nail mainly resembling those of ordinary cut nail machines, but the said machines are provided with dies suitable for cutting the chisel point and the necessary adjuncts for working and supporting the said dies.

A.D. 1875, January 26.—No. 293.

FEWSTER, William, of Pier Office, Margate, in the county of Kent, master mariner and harbour master of Margate, aforesaid.—"An improved method of and apparatus for saving life and property "at sea."

The invention is constructed in the shape of a duck with two heads and two necks, one at each end, the one at the fore end turned aft, and the one at the after end turned forwards, both looking downwards forming air pipes answering for ventilation.

The duck is constructed in the bottom to be fitted with water tanks over which will be a platform for provisions, passengers, luggage, ship stores, &c.; above this will be a deck forming the flooring of saloon, steerage, and cabins. The mast will be hollow and stepped one-third of the length of the duck from the fore end, answering for chimney of stove, also for ventilation.

The duck will vary in size according to the size of the ship and number of passengers she carries.

The duck's nest is built in the ships 'tween decks supported to and from the sides of the ship exactly the shape of the duck and can be built either of wood or iron. It is perforated up to ten feet, the draft of the duck; the duck itself can also be of wood or iron and suited either to poop or flush decks.

When the ship founders, the duck would float with passengers, crew, nautical instruments, &c., all saved.

The duck being placed in the aft third of the ship, her mast will serve as the ship's mizen mast.

In case of fire the captain would scuttle the ship.

A.D. 1875, January 26.—No. 300.

ROGERS, Benjamin William, of Stourport, in the county of Worcester, machinist.—"Improvements "in machinery for the manufacture of screws and bolts and other like articles."

This invention has reference to the feeding mechanism of the said machinery by means of which blanks are removed one at a time from the feeding rail and transferred to the clams, by which they are seized and held while being operated upon. An arm or lever, moving in a vertical plane, has at its end a fixed inclined finger, which is also curved on its outer side. To this fixed finger a second or sliding finger is connected, the blank to be fed being held by the end of the sliding finger in a fork of the fixed finger. When the lever carrying the fingers is in its raised position, the fingers are sufficiently opened to permit a blank to pass from the feeding rail between the ends of the fingers. On the descent of the lever the fixed finger first advances, seizing the blank between it and the end of the sliding finger. The two fingers now descend together holding the blank between them. The clams close and retain the blank. The lever now ascends, and the sliding finger permits the escape of the blank from between the fingers. On the lever arriving at the top of its stroke the fingers open and another blank is fed into them from the rail, and so on.

A.D. 1875, January 27.—311.

BOULTON, John, Captain and Adjutant, Edinburgh City Artillery Militia, residing at Number 8, Inverleith Terrace, Edinburgh.—"Improvements in apparatus for calling the attention of engineer, "stoker, and guards in charge of a railway train to danger signals."

The features of novelty are.—A projection made to rise between the rails working either in connection with a danger signal or placed on any part of the line. This projection operates on the apparatus for giving the alarm after mentioned.—This apparatus is carried by the engine or any of the carriages, and the bottom or dependent arm of this apparatus is made to swing on a pivot, and the apparatus being carried at a lower level than the top of the projection, and so placed as to strike the projection, the dependent arm must rise to enable it to pass over the projection.—The dependent arm is so formed at the top that on being raised by the projection as aforesaid, the shoulder of the dependent arm rises to a higher level than the top of it while at rest, and in so rising lifts a rod resting on the top of it.—This rod being thus raised presses a spring and thus withdraws a small bolt by which a chain or cord is retained.—The other end of this cord or chain is attached to the object which is to be operated upon in order to attract the attention of the man in charge.—The object which is to attract attention may be either a bell, the steam valve of the engine, or a broad colored plate, or other prominent object, and may be either a part of or attached to the engine or carriage, and will be so acted on by a spring or weight, that on the bolt being withdrawn and the cord released as aforesaid, the steam whistle or bell or the prominent object will remain sounding, or exposed, as the case may be, until the attention of the man in charge is called to it.

The advantage of my invention is that it provides a simple and efficacious signal by appealing to other senses in aid of that of sight.

A.D. 1875, February 4.—417.

CHAMEROY, Edme Augustin, of Rue du Faubourg St. Martin, 162, at Paris, manufacturer.—" Improvements in cocks for water, steam, air, or gases."

This invention has for object improvements in the construction of cocks in order to prevent the shock or recoil which is generally produced in water pipes at the time of closing the cocks.

The several improved arrangements of which the invention consists are all based on the principle of the slow closing of a movable valve whatever be the pressure of water in the supply pipe and notwithstanding the act of the person drawing the water.

A.D. 1875, June 29.—No. 2367.

THIERY, Charles Louis, of Boston, in the county of Suffolk, in the state of Massachusetts, in the United States of America.—" Improvements in machinery for manufacturing watch cases and kindred " articles."

This invention consists in the main of automatically feeding forward the swaging or shaping rolls of the machine in lieu of advancing or feeding them by hand, as heretofore practiced, but the invention also embraces various details of mechanism.

A.D. 1875, July 1.—No. 2395.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Robert Kirk Boyle, a person resident in the city, county, and state of New York, United States of America, electrician.*)—" Certain improvements in electro magnetic telegraphs where induced " currents are used, and also in apparatus for producing such induced currents."

The invention consists in combining induction coils with a non conducting and a conducting surface, with a battery in line of a telegraph and a chemical writing instrument, with local batteries and electro-magnets or with a needle telegraph, in such a manner that a constant current of electricity of either kind can be produced, that a continuous line will be drawn on the paper by the action of the line battery current, that a dispatch transmitted to a receiving station over the main line will be transmitted over an additional line without the aid of an operator, or that whenever a signal is sent over a main line, clear and distinct marks are obtained for each signal, however feeble and rapid the electric waves may be.

INDEX OF NAMES

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX FOR JAN. 1 AND 2, 1875,

AND TO

APPENDIXES FROM JAN. 3 TO JULY 2, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 27 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendix No. 1 with the weekly No. of the Index for the present year.]

A.

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—— C. D. (*Mathian & Solet*), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
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Alison, J., 957, Mar. 15 (*App.* 47.) Steam-boilers.
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Antisell, T. M., & Bruce, De V., 2016, June 16 (*App.* 49.) [Vapor and gas-engines.
Ayton, P. E., 84, Jan. 9 (*App.* 52) Attaching knobs to [spindles.

B.

Baker, D., 1577, Apr. 29 (*App.* 44.) Mariners' compasses.
Bannister, R. D., & Milligan, S. (Lake), 2245, June 18 [(*App.* 51.) Device for advertising.
Barker, A. (Alexander), 1633, May 3 (*App.* 45.) Railway [breaks.
Barron, W. S., & Britten, F. J., 118, Jan. 12 (*App.* 1.) [Centrifugal apparatus.
Bates, F. L. (Clark), 1639, May 3 (*App.* 45.) Locking [screw nuts.
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Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Benson, M. (*Redheffer*), 388, Feb. 3 (*App.* 32.) Freezing, [churning, &c.
—— M. (*Williams*), 437, Feb. 5 (*App.* 32.) Boots [and lasts.
—— M. (*Wicks*), 1199, Apr. 2 (*App.* 40.) Pattern [chains for looms.
Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.) [Burning bricks, &c.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Bois, A., 45, Jan. 5 (*App.* 1.) Safety guard for tram-cars, &c.
Bonner, J., 11, Jan. 1, Weaving.
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—— H. A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
—— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
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Boulton, J., 311, Jan. 27 (*App.* 1.) Railway signalling.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
—— G. T. (*Société Anonyme du Cuivre Français*), [2042, June 3 (*App.* 49.) Protosulphuret of [iron and sulphuretted hydrogen gas.
—— G. T. (*Société Anonyme du Cuivre Français*), [2084, June 5 (*App.* 50.) Kilns or ovens.
Bowman, J., 53, Jan. 6 (*App.* 47.) Bottles and stoppers.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9 [(*App.* 33.) Filling and corking bottles.
Britten, F. J., & Barron, W. S., 118, Jan. 12 (*App.* 1.) [Centrifugal apparatus.
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—— W. Morgan- (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of type.
—— W. Morgan- (*Johnson & Harding*), 2250, June 19 [(*App.* 52.) Tramway rolling stock.
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Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.) [Vapor and gas-engines.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning bricks, &c.
Buxton, T., & Thornley, G., 188, Jan. 18 (*App.* 30.) Casks.
—— T., & Thornley, G., 1518 Apr. 26 (*App.* 44.) [Jointing cask staves.

C.

Cave, J. O'C., 571, Feb. 17 (*App.* 34.) Rest for knives, [forks and spoons.
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Chapman, L., 1823, May 15 (*App.* 47.) Producing socket [eyes on tools.
Chaquette, E., 416, Feb. 4 (*App.* 32.) Shearing sheep.
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Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
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—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.

Clark, A. M (*Taft*),1153, Mar.30 (*App.*40.) Table cutlery
[and handles.
—— A. M. (*Edge*), 1615,May 1 (*App.*45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking
[screw nuts.
—— A.M. (*Rochow & Matthiessen*), 1810, May 14 (*App.*
[46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway
[for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro-
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[and shoes.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-
[menageries.
Crocker, S.L.,778, Mar. 3 (*App.* 36.)Smelting copper ores.
Crompton, G. (Morgan-Brown), 1967, May 29 (*App.*49.)
[Boiler anti-incrustation battery.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.*50.)Kilns or ovens.

D.

Dann, J.T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
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Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
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E.

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Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.

F.

Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
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[ing, &c., fibres.
—— W. & J., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c., fibres.
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[(*App.* 33.) Filling and corking bottles.
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Fitz, E. E., 187, Jan. 18 (*App.* 30.) Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4 (*App.* 1.) Drawers.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.*42.)Sewing-
[machines.
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Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.

G.

Gally, M. (Coddington), 1128, Mar. 27 (*App.*40.) Tele-
[graphy.
Garland, H. P., 229, Jan. 21 (*App.* 30.) Sewing-machines.
—— H. P., 2248, June 18 (*App.*51.) Sewing-machines.
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Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 11 (*App.* 52.) Fuel economiser for fire-
[grates.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Hamburg-American Sewing-Machine Co. (Jensen), 26,
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[June 9 (*App.* 50.) Writing, &c. by means of type.
—— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3 (*App.* 51.) Indicating
[speed of ships.
Harrison, S.L., 461, Feb. 6(*App.*33.)Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Haseltine, G.(*McVicar & McVicar*), 27, Jan. 2, Teaching.
—— G. (*Smythe*), 422, Feb. 4 (*App.* 32.) Balanced
[slide-valves.
—— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.*33.)
[Filling and corking bottles.
—— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.*
[33.) Rock drills.
—— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
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—— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
—— G. (*Bingham*), 1182, Apr. 1 (*App* 40.) Burning
[bricks, &c.
—— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
—— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
—— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
—— G. (*Edson & Silliman*), 1677, May 5 (*App.*45.)
[Paddle wheels.
—— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
Heard, J.R., 489, Feb.10(*App.*33.)Horse-shoe & other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Holland, W , & *Myers, H.*, 34, Jan. 4 (*App.* 1.) Umbrellas
[and parasols.
Hughes, A., 1311, Apr.10(*App.*42.) Reaping and mowing.
Hunt, E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.

J.

James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*) 26, Jan. 2, Printing metals.
Johnson, J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Transmitting musical vibrations, &c.
——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, June 9 (*App.* 50.) Writing, &c. by means of type.
——— *J. R., & Harding, G. P.* (Morgan-Brown) 2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, S. H., 156, Jan. 14 (*App.* 29.) Cocks or valves.
Jones, E., & Bayliss, M., 174, Jan. 16 (*App.* 43.) Nuts and washers.
——— R.A., & Perry, J.J., 12, Jan, 1, Lighting cigars, &c.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25 (*App.* 35.) Surfaces for steps, &c.
Kerby, J., 274, Jan. 23 (*App.* 31.) Boots.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
——— W. R. (*Fitz-Patrick*), 42, Jan. 4 (*App.* 1.) Drawers.
——— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-dressing machines.
——— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-menageries.
——— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting ores; making iron; furnaces.
——— W. R. (*McClintock*), 2080, June 5 (*App.* 50.) Compositions for paving, &c.
——— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather-pulp.
——— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing electrotype shells.
——— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-boiler valves.
——— W. R. (*Bannister & Milligan*), 2245, June 18 (*App.* 51.) Device for advertising.
Lee J., 131, Jan. 13 (*App.* 29.) Fire-arms.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Levet, C. (Wise), 3, Jan, 1, Boring rock, &c.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail hank or shackle.
Luckenbach, F. A., 243, Jan. 21 (*App.* 50.) Casting and annealing slag.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.) Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12 (*App.* 52.) Iron, steel, &c.

M.

McClintock, J. R. (Lake), 2080, June 5 (*App.* 50.) Compositions for paving, &c.
Mc Vicar D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
——— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.) Moulding bricks, &c.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
——— *M.* (Lake), 949, Mar. 13 (*App.* 38.) Flour-dressing machines.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.* 44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14 (*App.* 46.) Hydraulic engines, &c.
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Miller, W. R., 24, Jan. 2, Pianos.
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Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.) Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20 (*App.* 35.) Filtering water.
Moreau, E., 228, Jan. 21 (*App.* 30.) Sewing-machines.
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Morgan-Brown, W. (*Crompton*), 1967, May 29 (*App.* 49.) Boiler anti-incrustation battery.
——— W. (*Harding & Johnson*), 2119, June 9 (*App.* 50.) Writing, &c. by means of type.
——— W. (*Johnson & Harding*), 2250, June 19 (*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-way for warehouses.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and utilizing steam.
Mullholland, H. (Rogers), 161, Jan. 15 (*App.* 1.) Cut nails.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.) Sewing-machines.
Myers, H., & Holland, W., 34, Jan. 4 (*App.* 1.) Umbrellas and parasols.

N.

Nairn, M. B., 35, Jan. 4 (*App.* 1.) Floor cloths.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding, &c. fibres.

O.

Outerson, A. & J., 558, Feb. 16 (*App.* 34.) Filters.
——— J. & A., 558, Feb. 16 (*App.* 34.) Filters.

P.

Paper Box Machine Co., The Cleveland (Haseltine), 1008, Mar. 18 (*App.* 38.) Paper boxes.
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Phelps, H. W., & Winchester, E. S. (Haseltine), 485, Feb. 9 (*App.* 33.) Rock drills.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
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Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2, Preparing fibres for spinning.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank
[or shackle.
Redheffer, W. (Benson), 388, Feb. 3 (*App.* 32.) Freez-
[ing, churning, &c.
Reynolds, G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
—— T. B. & B., 16, Jan. 1, Flocking fabrics.
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[(*App.* 46.) Hydraulic engines, &c.
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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 2, 1875, and to Appendixes from January 3 to July 2, 1875.

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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 3 to January 9, 1875.

A.D. 1875, January 4.—No. 29.

POOLE, William, of Manchester, in the county of Lancaster.—(*A communication from R. E. Lowe, of Kane, in the state of Illinois, United States of America.*)—" Certain improvements in the construction " of planes for cutting blind slats."

The novelty of the invention consists in constructing a plane for cutting blind slats with an under recess provided with an adjustable shoe, which can be raised or lowered by means of thumb set screws. The width of the under recess and the distance or adjustment of the shoe from the cutting-bit regulates the width and thickness of the slat to be cut. The cutter is fixed to the stock by clamps, and is of a length sufficient to allow fresh portions of its edge to be presented without removing the same from the stock. A gauge splitter is also applied for dividing in two the width of the slat being cut.

A.D. 1875, January 4.—No. 30.

ELLISON, John, of Wakefield, in the county of York, engineer.—" Improvements in the method of " and apparatus for self acting fasteners for railway wagon or other doors."

This invention relates to an improved method of fastening doors of railway wagons, and consists of a cast iron metal block with tongue fitted into V^d slide; this tongue of its own weight forms the fastener by falling over the wrought iron hinge or other plates. It is, however, also arranged to be kept up by a spring which is liberated by the shutting of the door.

A.D. 1875, January 4.—No. 31.

KENDRICK, Thomas, of Balsall Heath, in the county of Worcester.—" Certain improvements in " the ornamentation of coffin furniture."

These improvements have for object the ornamentation of coffins and coffin furniture with designs upon paper, whether printed, painted, photographed, embossed, or otherwise produced, or the application of embossed paper instead of metal plates and the application of stencilling for like purpose.

A.D. 1875, January 4.—No. 32.

CATLOW, Christopher, overlooker, and RICHMOND, Thomas, cotton manufacturer, both of Burnley, in the county of Lancaster.—" Improvements in looms for weaving."

This consists, *Firstly*,—In an improvement in the means or apparatus employed for "recovering" or returning the picking stick and picker after picking.

Secondly. In an improvement in the crank arms.

Thirdly. The use of a new or improved lining or packing to be applied to the interior of the brasses or necks of the crank of the crank shaft.

A.D. 1875, January 4.—No. 33.

DUDGEON, Arthur, of No. 22, Great George Street, Westminster, London, S.W., and No. 163, Great Brunswick Street, Dublin, engineer.—" Improvements in the distillation of spirituous liquors, " and in apparatus to be employed therefor."

This invention consists of improvements upon the invention of George Johnston, which said invention of the said George Johnston forms the subject of the Patent No. 1568, dated 20th May 1869.

A.D. 1875, January 4.—No. 34.

HOLLAND, William, of the firm of Cox, Brothers, and Holland, of Birmingham, in the county of Warwick, manufacturers.—(*Partly a communication from Henry Myers, of No. 259, Rue St. Martin, Paris, France.*)—" Improvements in the manufacture of parts of umbrellas and parasols, and in " machinery to be used in the manufacture of parts of umbrellas and parasols."

One part of this invention consists in making the notches of runners and top notches by placing on a barrel formed of a solid drawn tube two ring like blanks, each blank having a short tube on its inner edge, the said tube fitting the barrel. The tubular part of one of the blanks abuts against a shoulder or stop on the barrel, and the tubular part of the other blank bears against the face of the first blank. The end of the barrel is turned over the face of the second blank, and the whole of the parts are secured together by soldering or by plunging the partly made runner or top notch into a bath of melted zinc or other easily fused metal or alloy.

Another part of the invention consists of a machine for making ribs composed of a series of horizonal tools for fashioning the joint end of the rib, and for cutting away a piece at the joint end; for marking the rib for the stretcher joint, and for forming the knob or head at the opposite end of the rib, and flattening the wire near the knob or head. The tools are carried in slides on the bed of the machine, levers worked from cams on a shaft under the bed giving motion to the slides. The wire from which the ribs are made is fed by preference direct from the bobbin. Another part of the invention consists of feeders for feeding cut lengths of wire into machines for making ribs and stretchers. One feeder consists of two horizontal arms a short distance apart jointed to a lever having a backward and forward motion, by which motion the wires placed in a pile in a vertical slot or hopper are allowed to descend one at a time from the hopper, and are received in the machine, the advance of the upper arm supporting the pile of wires, while the retiring of the lower arm allows the bottom wire of the pile to fall. Or the advance of one arm may be made to push the bottom wire from under the hopper, the retiring motion of the arm allowing the pile to descend, so as thereby to bring another wire opposite the arm ready to be fed by the next advance of the arm.

A.D. 1875, January 4.—No. 35.

NAIRN, Michael Barker, of Kirkcaldy, Scotland.—" Improvements in machinery for preparing " floor cloths for printing."

The object of this invention is to facilitate the trowelling or applying paint to the surface of cloth, and the subsequent drying and rubbing of such cloth to prepare it for printing.

A.D. 1875, January 4.—No. 36.

LESTER, Henry Edward, junior, of the firm of Lester and Perkins, of Victoria Docks, in the county of Essex, engineer, and **HALLETT, George**, of Millwall, in the county of Middlesex.—" Improve- " ments in apparatus for releasing boats from ships ready for lowering same into the sea."

This invention mainly consists of the following arrangements:—A rod with a lever attached is fixed on the side of the chocks and skids worked from the inside on the deck of the ship, and tumblers are fixed on each end to rod in such a manner that in throwing the lever before mentioned down, the lashings of the boat are released. Balanced hooks are secured to skids at each end fitted in tumblers taking the lashing link. The lock for the outer chock consists of a single joint and stud which is unlocked by one movement of the said lever.

A.D. 1875, January 4.—No. 37.

VAUGHAN, Edward Primerose Howard, F.C.S., of 67, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Alphonse Blot, residing at Paris, in the Republic of France.*)—" An " improved press for the extraction of the liquid constituents of fruits and other vegetable matters."

This press is mainly composed of three Archimedean screws of varying pitch working together, and so arranged in an outer skeleton casing that the material to be treated, fed at one end through a hopper, is subjected to progressively increasing pressure until it reaches the upper end of the apparatus, where the solid residues are expelled, while the liquid constituents, escaping through the perforated casings, are collected by a conduit which carries them to a reservoir of suitable capacity and form.

A.D. 1875, January 4.—No. 38.

SCOTT, John, of King William Street, in the city of London, gentleman.—(*A communication from Hector Gerard, of Paris, in the Republic of France.*)—"A new or improved preparation or dressing for " stiffening or finishing textile fabrics and materials, and which is also applicable to other useful " purposes."

This invention relates more particularly to the dressing or finishing of textile fabrics and threads or yarns, and consists in the use of fecula starch, the pulp of tuberous and other roots, and farinaceous and amylaceous substances generally treated with caustic alkalies or alkaline salts, for the preparation of a stiffening material or agent for that purpose, and which it is proposed to designate "apparature."

This material or agent so prepared is, however, also applicable as a substitute for gum, glue, or other adhesive material, as a thickening agent in printing fabrics, for the prevention of incrustation in steam boilers, and to a variety of other useful purposes.

A.D. 1875, January 4.—No. 39.

WAVISH, James, of East India Road, in the county of Middlesex.—"Improvements in apparatus " for facilitating the proper combustion of fuel."

This invention consists in the employment of a central tube or air admitting chamber to fireplaces, and also in the employment of a chamber through which air is admitted to the sides of the fuel.

A.D. 1875, January 4.—No. 40.

KENNEDY, William, flax spinner, and **ACHESON, George**, mechanic, both of Belfast, Ireland.— "Improvements in machinery for spinning flax and other fibrous materials."

The chief object of our invention is to so arrange the parts of spinning machinery as to obtain an increased yield of yarn and speed with less friction and strain upon the yarn than heretofore. Our improvements are also calculated to simplify the construction of the machine and to reduce the wear and tear of some of the working parts of the machinery.

A.D. 1875, January 5.—No. 41.

CARVER, James, and **PIGOTT, George**, both of the town and county of the town of Nottingham.— "Improvements in bobbin net or twist lace machines."

The inventors arrainge two or more lace machines upon one pair of standards, and provide each machine with a driving shaft that carries disks which have teeth on part of their circumferance, which alternately revolve one or other of two wheels carrying crank pins which operate the catch bars. By this arraingement the machines do not require bolting to the walls or cieling and can be driven at a greater speed than heretofore.

A.D. 1875, January 4.—No. 42.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Joseph Fitzpatrick, of Philadelphia, Pennsylvania, United States of America.*)—"Improvements in drawers."

The object of this invention is to provide certain improvements in the manufacture of men's and boys' drawers, by the peculiar construction and shaping of which, comfort and convenience in the fit and increased durability in the wear are obtained.

A.D. 1875, January 5.—No. 43.

SIEMENS, Charles William, of No. 12, Queen Anne's Gate, Westminster, in the county of Middlesex. —"Improvements in the construction and working of furnaces for the production of iron, steel, and " ferro manganese, and in processes connected therewith."

This invention relates to lining rotary and other reducing furnaces with blocks of wood, rendered incombustible in some cases by impregnation with metallic salts, and set in refractory mortar; to constructing midfeathers of furnaces with vertical air flues to keep them cool; to arranging regenerative gas furnaces with pockets between the regenerators for collecting dust carried over by the products of combustion; to mounting steel ingot moulds on a skeleton turntable for facilitating the tapping of the metal; to producing ferromanganese in a rotative wood lined furnace; to reducing iron ore in the same; and to the preliminary calcining of the ore with the application of salt and water vapour for aiding the liberation of phosphorus and sulphur.

A.D. 1875, January 5.—No. 44.

GREEN, Josiah, of Redditch, in the county of Worcester, beer retailer.—"A new or improved "apparatus to be applied to fire grates for economizing fuel."

This invention consists of a portable and detachable frame of bars or basket which is hooked to or suspended in front of an ordinary grate. The back of the frame or basket is open, and the front is inclined from the flat bottom upwards. By the large surface of burning fuel, which is exposed when the apparatus is in use, combined with its projecting position, a large amount of heat is radiated into the room or apartment and fuel thereby economized.

A.D. 1875, January 5.—No. 45.

BOIS, Alexis, of Brussels, in the Kingdom of Belgium, civil engineer.—"An improved guard or "safety apparatus applicable to tramway cars and other vehicles."

This invention consists in covering or enclosing entirely or partially by one or more guards or safety apparatus the wheels of tramway cars and other vehicles and the space between the frame of such vehicles and the rails to prevent accidents to passengers or others falling or being thrown down in the path of the said vehicle. The said guard or safety apparatus consists of a shield of sheet metal, or a grating of iron or other bars, or a trellis or net work of wire or other material affixed to a metal or other frame shaped for the purpose; the guard or safety apparatus is mounted upon or suspended to the axles of the wheels or by preference to the axle boxes of the said wheels, in which latter case the axle boxes are provided with friction rollers grooved or flanged, upon which vertical slides or slots in the guard frame fit, so as to allow a certain amount of play below the lower rollers. If preferred, the friction rollers may be mounted on the guard frame, and the slots or slides made in or on the axle boxes or sliding pieces on the axle boxes, or on the guard frame, may work in slides in the guard frame or axle box; or the frame may be connected to each of the axle boxes by rods adjusted as in an ordinary link motion.

The lower edge of the guard is provided with wheels, and apertures closed by doors may be made in different parts of the said guard.

A.D. 1875, January 5.—No. 46.

BONNEFOND, Alexis, of Boulevard de Strasbourg, No. 123, at Paris, engineer.—"An improved "meter or apparatus for measuring water and other liquids."

In this improved meter or apparatus the following features or conditions are combined:—

1st. As a moving power the employment of an Archimedean screw with hollow body and several very inclined threads.

2nd. An air chamber disposed to preserve the registering or counting mechanism from contact with the water or other liquid, and to suppress all joints on the rod which transmits the motion from the screw to the registering mechanism; this air chamber serves as a reservoir to regulate the pressure.

3rd. A special arrangement of registering mechanism with discs, such arrangement being based on the successive driving of wheels having alternately one tooth and ten teeth.

A.D. 1875, January 5.—No. 47.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Claus Van Haagen, of Philadelphia, Pennsylvania, United States of America.*)— "Improvements in machines for sharpening twist drills."

This invention has for its object imparting an accurate cutting edge to a twist bit or drill, and consists of a peculiar arrangement of mechanism whereby that operation is greatly facilitated.

In the operation of sharpening the twist drill, if the drill be simply rotated while its cutting end is applied to the stone, the result will be inefficient cutting edges, the absence of the requisite chisel point, and the reduced portions will be at the same angle throughout in respect to the longitudinal central line of the drill; whereas each of the said portions should present an angle gradually diminishing or becoming more acute from the cutting edge to a given point in respect to the said central line. This conformation of the end of the drill may be obtained by simply moving the said drill radially, while the end of the drill is applied to the stone and while it is turned on its own axis, a slight forward movement being at the same time imparted to the drill.

In carrying out this invention a machine is constructed based on these required movements of the drill while it is applied to the stone.

A.D. 1875, January 5.—No. 48.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Jacob Russell, of the city and state of New York, United States of America, gentleman.*)—"Improvements in machinery for making horse-shoes."

One object of my improvements is to effect the thinning of the inner edge of the shoe at a stage of the operation when only the outer edge or side of the shoe is sustained by the upright walls, and thus render it practicable to press down the inner edge of the shoe to almost a knife edge, if such degree of thinness is required; and another object is to effect the pressing of the shoes in a female die which has a gradual taper upward, and at the same time to be able to discharge the shoe automatically from such a die, this manner of pressing the shoes allowing me to make them with an inward draft or narrower at their base than at their top, and thus produce shoes which will not cause the feet of horses to interfere. And another object of my invention is to effect the proper feeding and cutting off and supporting of the iron while the machine is in continuous operation. Another object is to effect a compression or "upset" of the ends of the pieces of iron of which the shoes are formed by the shears, which cut off the iron and thus increase the density of the heel ends of the shoes.

A.D. 1875, January 5.—No. 49.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from J. Franklin Peck, of Springfield, county of Hampden and state of Massachusetts, United States of America.*)—"Improvements in mattresses and pillows for use on shipboard, whereby they may be converted into life preservers, life mattresses, and other life saving apparatus."

The invention consists in employing the hair of the deer, [*elk**], moose, antelope, mountain sheep, or mountain goat, as the material for constructing a buoyant mattrass and life preserver; also in the life preserving mattrass and pillows forming a perfect berth bed to be used on shipboard, which in a moment can be converted into a life preserver [*to be worn on the person, and a buoyant mattress**] to be used as a float or in the construction of a life raft.

A.D. 1875, January 5.—No. 50.

DEACON, George Frederick, of Liverpool, in the county of Lancaster, civil engineer.—"Improvements in apparatus for measuring the flow of water in pipes."

This invention relates to improvements made with the object of reducing the wear and increasing the efficiency of apparatus described in the Specifications of Patents No. 937, 1872,† and No. 4264, 1873.

A.D. 1875. January 5.—No. 51.

TURNOCK, Joseph, of Purland Chase, Ross, in the county of Hereford, brewer.—"Improvements in steam engines or engines for the more efficient use of steam for driving machinery."

This invention has for its object improvements in steam engines, or engines for the more efficient use of steam for driving machinery.

The engine consists of a fly wheel cogged on its outer rim or edge, or formed with cavities in its periphery to receive steam from a chest held in contact with it, and constructed to deliver the steam supply into the cavities in such a manner as to cause the fly or cogged wheel to revolve on its bearings in such a way as to give motive power to any kind of machinery.

A,D. 1875, January 6.—No. 52.

GANDY, Maurice, of Liverpool, in the county of Lancaster.—"Improvements in treating and preparing paper, paper felt, and paper stuff to manufacture a new material to be used as a substitute for wood, leather and other materials in 'construction,' and applicable to various useful purposes."

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* The word "elk" and the words "to be worn on the person, and a buoyant mattress" are found in the copy of the Abridgment delivered by the Applicant, but do not appear in the original Abridgment.

† This should be 1873.

In carrying out my invention I form fibrous materials into paper in the usual way, but in the manufacture of the said paper from such fibrous materials I " pulp " and " bleach " as little as possible, so as not to destroy the fibre and to retain all the strength possible in the material. As the paper so manufactured comes from the " rolls " I take with it a material either of vegetable, silk, or wool, which has passed through a carding machine, but has not been subjected in any way to " pulping " I pass the two materials together through rolls, and thus by pressure blend them into one sheet. I then by hydraulic or accumulative pressure proceed to incorporate a sufficient number of of layers of the material before described one on the other to form the required thicknesses from which to manufacture the different articles for which I claim my invention to be applicable.

A.D. 1875, January 6.—No. 53.

BOWMAN, Jonathan, of 12, Montpelier Road, Peckham, in the county of Surrey.—" Improvements " in the form of bottles, and in the means employed for stopping or corking the same and other " similar receptacles."

The features of novelty in this invention consist in the formation of the upper part of the necks, or heads of bottles, and in the construction of stoppers for the same, whereby the bottles are more readily opened or closed, and the use of any corkscrew is entirely dispensed with.

A.D. 1875, January 6.—No. 54.

MILNER, Ezra, of Clayton, near Bradford, in the county of York.—" Improvements in furnaces for " steam boilers and other uses."

The object of the invention is to facilitate the combustion of the smoke produced by the combustion of the fuel in steam boiler and other furnaces, and thereby to effect increase of the heating power obtained by such combustion and economy of fuel.

In addition to the ordinary fire bars other set or series of fire bars, supported a short distance below those for the support of the fuel in the ordinary way are employed, extending from about the front end of the furnace to about the same distance back as the ordinary bars, and of corresponding extent in width.

A space is left between the inner ends of both series of bars and the back of the furnace or the fire bridge, varying in extent with the size of the furnace, but say generally of from three to six inches for the passage of air up from below to act on the smoke and heated products passing from the fire.

A guard is provided to the inner ends of these ordinary fire bars to prevent the fuel from being pushed or falling over and through the opening referred to.

A.D. 1875, January 6.—No. 55.

DICK, Alexander, of Cannon Street, in the city of London.—(*A communication from Paul Giffard, residing at Paris, in the Republic of France.*)—" An improved compressed air or gas spring, and stuffing " box to be used in connection therewith."

Compressed air or gas is forced into a reservoir, in the cover of which is an aperture in which the stuffing-box is fixed. The latter consists of a hollow ring of hardened india rubber, the central portion of which has an inverted conical or funnel shaped section, a space being formed between the exterior of such portion and the vertical exterior of the ring. The lower edges of the inverted cone and of the vertical external portion of the ring are respectively supported by a metallic ring or collar, in which are apertures through which the condensed air or gas passes. A plunger passes through the stuffing box for the reception of the weight or strain, the lower part thereof being capable of working up and down in the reservoir, and having a collar or guide at the extremity with apertures for the air or gas to pass through. The air or gas passes upwards and exerts pressure upon the exterior of the conical portion of the stuffing box, thereby pressing it against the plunger and enabling it to work in a perfectly air or gas tight manner.

A.D. 1875, January 6.—No. 56.

FISHER, Henry, and **RUTHERFORD**, John Hunter, both of the town and county of Newcastle upon Tyne, the said Henry Fisher being an ironfounder and the said John Hunter Rutherford being a physician and surgeon.—" Improvements in the mode of applying and utilizing heated air, and in hot " air engines or hydro pneumatic motors."

This invention relates to the application and use of a column of water to transmit the power obtained by the expansion of heated and compressed air to the work to be done and the utilization of the heat in the rejected air.

For this purpose, air, highly compressed, is heated in a furnace and then passed into a chamber where it comes in contact with a column of water, the pressure and expansion of the air operate upon the column giving motion to it, which motion can be communicated to a reciprocating piston, or other mechanical arrangement for converting or applying power.

The improved engine is composed of three essential parts, viz., an air compressor, an air heating furnace or apparatus, and a working chamber or chambers.

A.D. 1875, January 6.—No. 57.

SINGTON, Theodore, of Manchester, in the county of Lancaster.—"Improvements in the construction and working of railway signals."

This invention comprises:—

First. The construction and the mode of fixing the signal to the signal post.

Secondly. The use of the magnet and armature in conjunction with the signal for working the same.

Thirdly. The form and mode of working the signal levers.

Fourthly. The mode of interlocking the signal levers with the point levers.

Fifthly. The use of the electric current for working the signal.

Sixthly. A powerful electric bell intended to be used as a fog bell.

Seventhly. An improved mode of arranging the signals and posts arising out of the greater facilities offered by this new agency.

A.D. 1875, January 6.—No. 58.

WOLLASTON, Charlton James, of 8, Park Place, Marylebone, in the county of Middlesex.—"Improvements in thermo-electric apparatus."

This invention relates to apparatus for obtaining electricity in a convenient and economical manner from heat generated from the combustion of fuel.

A.D. 1875, January 6.—No. 59.

BURLOCK, Frederick Foster, of Birmingham, Connecticut, United States of America, but at present of 47, Lincoln's Inn Fields, in the county of Middlesex.—*(A communication from Charles Henry Chapman, of Shirley, Massachusetts, United States of America.)*—"Improvements in looms."

This invention relates to means to be employed with looms generally for arresting the motion of a loom when a breakage of a warp thread occurs, and consists of a peculiar arrangement and combination of mechanism by means of which the failure of a warp thread is caused to bring into operation or release certain projections or catches arranged in connection with apparatus for shipping the driving belt, so as to effect automatically the removal of such driving belt from a fast on to a loose pulley and the consequent cessation of the motion of the loom.

A.D. 1875, January 6.—No. 60.

WILKINSON, Alexander, civil engineer, of 41, High Street, Marylebone, in the county of Middlesex. —"The manufacture of substances for road making and street paving, such substances being also applicable for fuel for locomotive, stationary, or portable engines, household and other grates."

Peat or turf is ground in a mill to a suitable powder. It is then amalgamated with pitch tar, and bitumen, and after boiling, stirring, and cooling, it is pressed by means of hydraulic pressure into blocks of the required shape for road making and street paving in general.

Or peat is ground fine and mixed with plaster, sand, lime, or with roman or other plastic body as a cement.

For fuel the peat is mixed with coal dust, coke dust, or common ashes, and after immersion in a solution of pitch, tar, and bitumen, is pressed into blocks, and will be found capable of giving a very great heat.

A.D. 1875, January 6.—No. 61.

HUGHES, Edward Thomas, of the firm of Hughes and Son, patent agents, 123, Chancery Lane, London.—(*A communication from Charles Parker, of Meriden, in the county of New Haven, and state of Connecticut, United States of America, manufacturer.*)—"Improvements in claw hammers, parts of which "are applicable to other hammers."

The first part of this invention relates to the construction or application of a stud or wrought metal head to a cast metal body.

The second part relates to the application of steel or wrought metal faces to the claws.

And the invention consists—

First, in a cast metal body with a steel head or face, the two parts secured together in the process of casting.

Second, in the introduction of a steel face to the claw secured in the process of casting.

A.D. 1875, January 7.—No. 62.

BAKER, Richard, of the town and county of the town of Nottingham.—"Improvements in "jacquards."

The inventor employs single and double hooked wires and operates them by needles having a projection or crank on their sides, which when traversed by the card or cards clear one or more grids, which would otherwise lift them; the projections or cranks on the needles are instead of the eye in the needles as usually constructed; the wires are held by slotted plates instead of the wires being passed through eyes in the needles in the usual way.

A.D. 1875, January 7.—No. 63.

BRADLEY, George, and MADDERSON, Thomas, both of Great Ayton, in the county of York.—"Improvements in the construction of machinery for breaking and crushing stones, ores, and other "substances."

A horizontal rocking lever is combined with two toggles, two moveable and two fixed jaws. The lever is mounted on a cross shaft between the side frames of the machine, the cross shaft passing the centre of one end of the lever. To the other end of the lever one end of a short connecting rod is attached, the centre upon which it works being placed in an eccentric hole in the rocking lever, the other end of the connecting rod being connected by an eccentric or other suitable means to the main shaft. At the top and bottom of the face of the rocking lever an aperture is bored out for the reception of the toggle seat. The two sets of jaws are placed one above the other, in front of the lever, each of the moveable jaws being provided at their rear with a toggle seat corresponding to those formed in the lever, and connected to the latter by means of a toggle, the toggle connecting the upper moveable jaw with the upper portion of the lever being of greater length than that connected with the lower pair of jaws. When motion is given to the main shaft of the machine, the horizontal lever is caused to rock or vibrate, thus alternately actuating the upper and lower moveable jaws, the material under treatment passing from the upper pair of jaws to the lower.

A.D. 1875, January 7.—No. 64.

MARTIN, John Cowdery, of 5, Upper Hill Street, Richmond, in the county of Surrey.—"Improvements in the manufacture of emery and other wheels used for grinding or polishing, and in "apparatus employed therewith."

Agglutinating together the particles of emery to form wheels, with a composition of leather dissolved in glue; and preventing grinding wheels of all descriptions from flying to peices when driven at high speeds, by making them thicker at and towards the centre than at the edge, and covering the sides to within a short distance of the edge with hollowed metal plates firmly screwed against the wheel, so that in case of rupture the several parts would be held secure, as the thicker portion of the wheel towards the centre could not pass through the narrower opening between the plates towards the periphery, and the peices of the wheel become scattered. A brush roller also revolves against the surface of the wheel.

A.D. 1875, January 7.—No. 65.

SIMMONS, Charles, of Pitsmore, Sheffield, in the county of York, engineer.—" Certain improve-" ments in steam boilers to prevent their priming."

The principle of this invention is an arrangement whereby the steam has to turn downwards between an inner and outer pipe before passing from the boiler freeing it from water which latter falls back into the boiler through the outer pipe which is carried beneath the surface of the water.

This may be facilitated by means of cross bars or strips placed between the inner and outer pipes.

A.D. 1875, January 7.—No. 66.

KIDD, Joshua, of 24, Martin's Lane, in the city of London, engineer—(*Partly a communication from Levi Arnold, of the city and state of New York.*)—" Improvements in the manufacture of gas for lighting " and heating purposes and in the apparatus connected therewith."

The novelty of my invention consists first in the manufacture of lighting or heating gases in carbon, then carburetting this gas with hydrocarbon vapour, after which I pass the carburretted gas through a red hot retort; by this means I make the mixture a fixed incondensible gas of high illuminating power. The second part of my invention consists in a novel arrangement and method of setting the retorts. I connect together two or three horizontal gas retorts, one above another, with only one stand pipe or gas outlet leading to the hydraulic main from the combined retorts; when using 3 retorts the gas from the lower retort must pass over the coal placed in the two upper retorts, or the gas from the upper retort before escaping may be forced downwards over the coal in the lower retorts. All the retorts should be charged with coal and operated in the ordinary way.

A.D. 1875, January 7.—No. 67.

BOYMAN, Richard Boyman, of Park Hill, Clapham Park, Surrey.—" Improvements in rotary " engines moved by the expansive power of fluids, in the means of giving them such power, and in " the machinery and application of the same."

In the Specification of a former Patent No. 3515, of 1873, the inventor described a " rotary cellular engine " without cut off for expanding the steam, and without condensing or exhausting it. The present improvements consist of eight things, viz.:—

1. Making such engine combine three things—(1) the greatest area for the action of the motive power with (2) the fewest cells, and (3) a right-angle action all round the wheel.
2. Making the ring valve (described in the said Specification) to start, stop, and reverse, the rotary cellular engine more simply; also to regulate the power of such engine.
3. Using confined water, hydrogen gas, oil, glycerine, or alcohol, and giving them expansive power as prime movers (1) by fuel and (2) by slaked lime.
4. Doing the same thing without fuel or artificial heat by utilizing the power of natural heat and cold to expand confined fluids; if water at its maximum density and contraction, which is at a temperature of 39° Fahrenheit.
5. A safety valve for such great pressures as the said prime movers will exert; also to work a damper in the funnel to regulate the draught.
6. A force pump to feed the engine worked by one of the inventor's pump rotary engines.
7. A condensed and heated air whistle and gong or bell.
8. Neutralizing the frictional weight of the rotary engine on its axle.

A.D. 1875, January 7.—No. 68.

WACKETT, Joseph, of the firm of Wackett and Hill, of Hertford, in the county of Hertford, smith. —" An improved instrument or apparatus to be used in the slaughtering of animals."

The instrument is made somewhat of the form of a mallet, its crosshead is made hollow, and through it is passed a steel rod with a sharp point or with a sharp edged hollowed extremity.

The rod is retained in the hollowed head by an enlargement which bears against the inside of a cap screwed onto the rear end of the crosshead, and it is kept in this position by a helical spring encircling it and having its other bearing against the inner face of the front end of the crosshead.

The end of the rod opposite its pointed or cupped end is provided with an enlarged head, In use the instrument is held by the left hand with the pointed or cupped end of its rod on the skull of the animal, the enlarged head of the rod is then struck sharply by a mallet or other suitable striking instrument held in the right hand, which causes its sharp end to penetrate the skull and cause the instantaneous and painless death of the animal.

A.D. 1875, January 8.—No. 69.

ELLIS, Thomas, of No. 4, Tranquilla Terrace, Fulham Road, Hammersmith, in the county of Middlesex.—" Improvements in the preparation of dried yeast, and in purifying and removing the bitter taste " from the yeast of porter, ale, and beer, and in apparatus to be used for this purpose."

This Provisional Specification describes thoroughly drying, &c., yeast, so that it will keep a long time and in apparatus to be used for this purpose.

A.D. 1875, January 8.—No. 70.

PYE, Roger, of Blackburn, in the county of Lancaster, agent.—" New or improved machinery for the " manufacture of shuttle springs."

The features of novelty in this invention consist in mounting the usual block at the lower extremity of a connecting rod attached to a crank shaft. This shaft communicates motion to two other crank shafts, one of which operates a roller and the other a pair of tongue pieces which come into play at the proper instant for forming the spring and for drawing off the springs when formed, and dropping them into the hardening liquid.

A.D. 1875, January 8.—No. 71.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from Gottlieb Wilhelm Daimler, of Muelheim on the Rhine, in the German Empire, engineer.*)—" Improvements in motor engines worked by gas or combustible vapour and air."

According to this invention a water jacketted cylinder open to the atmosphere at both ends contains, firstly, a working piston connected by a piston rod, crosshead, and connecting rods to an engine shaft; and secondly, two other pistons one on each side of the said working piston. These latter pistons are loose in the cylinder and operate in the following manner:—Assuming the working piston to be at the end of its back stroke, resting closely against the back loose piston and with a space intervening between it and the front loose piston, into which space an explosive mixture of air and gas or petroleum vapour has been drawn from an inlet valve; then on the ignition of the explosive charge the front loose piston is propelled rapidly to the front end of the cylinder, where it is retained by an arrangement of expanding wedges which wedge it tight in a conical enlargement at the ends of the cylinder.

A partial vacuum being thus produced in the cylinder by the expansion and cooling of the products of combustion, the working piston and with it the back loose piston is caused by atmospheric pressure to travel towards the front end of the cylinder.

The working piston carries a sliding rod which, as it approaches the front loose piston, comes in contact therewith and also with the back loose piston, and thus arrests the motion of the latter, while the working piston in continuing its motion to the end of its stroke causes a space to be formed between it and the back loose piston, into which a fresh charge of gas and air is drawn through a second supply valve. The charge being ignited, the motions of the several pistons are effected in the manner above described, but in the contrary order and direction, the front loose piston which was before wedged tight being again freed so as to return with the working piston by being pushed outwards by the latter, whereby the wedges in becoming free are contracted by springs.

The working piston in approaching the front loose piston expels the products of combustion from between them through a discharge valve in the cylinder, and buffers are provided at each end of the cylinder, against which the working piston presses the loose piston, so as to expel all the gas and insure a close contact between them.

The supply of gas and air to the cylinder is effected by a conical valve at each end, having passages in its stem through which gas and air enter the valve box when the valve is open. The ignition of the charge in the cylinder is effected by a disc on the valve stem which, as the valve closes, carries a portion of flame from a gas jet into the valve chamber, at the same time cutting off the communication between the valve chamber and the gas jet. The supply valves are opened at the proper times for the admission of gas and air by means of cams on the engine shaft, and are closed by the action of springs.

For working the engine by petroleum vapour instead of coal gas, the liquid petroleum is caused to flow in a small stream into a pipe in the water jacket of the cylinder, where it becomes vapourised by the heat of the water, and is then conducted to the supply valve. The air supply is in this case also caused to pass first through a pipe in the cylinder jacket to become heated. The power of the engine is regulated by means of a governor in such manner that when the speed of the engine is too great the supply of combustible gas is entirely cut off, and the engine performs its strokes without any explosion of gas and air until the speed is again reduced. This is effected by means of a valve, the stem of which is raised or lowered by the governor so as to bring a head upon the stem, either above a projection on the face of a bevel wheel on the engine shaft (in which case the valve is open), or below the projection, in which case an incline on the projection closes the valve. A flap valve is also provided in the supply pipe for preventing more than the requisite quantity of gas from entering the cylinder. The piston and piston rod are cooled by the circulation of water therein, the water being made to enter from the water jacket of the cylinder into a branch pipe on the front end of the piston rod, the branch pipe having a small receptacle on its end which is made to open a valve in the water jacket when the piston rod arrives at its end stroke.

A.D. 1875, January 8.—No. 72.

BLUCK, Edgar, of Old Cavendish Street, in the county of Middlesex.—"Certain improvements in "the construction of railway carriages designed for the purpose of preventing accidents."

The novelty of the invention consists in applying and securing to the framing of railway carriages two or more tubes to one end thereof, and two or more corresponding projecting bars to the other end thereof; the said projecting bars when the train of carriages is coupled up slide in the cylindrical tubes of the next carriage, so that in the event of the wheels becoming fractured or broken during transit or otherwise, the body of the carriage, if the wheel is disabled, is borne up and supported by its own rods and tubes and those of the carriage immediately in front and behind the same.

A.D. 1875, January 8.—No. 73.

WHITTAKER, Thomas, of Accrington, in the county of Lancaster, engineer, **DUXBURY, Joseph**, of the same place, engineer, and **CLAYTON, John**, of Burnley, in the county of Lancaster, engineer.—"Improvements in and applicable to machinery for moulding bricks, tiles, and other like "articles."

This relates to machinery or apparatus in which the brick or like article is formed by pressure between two plungers or dies, and consists :—

In using eccentric, elliptical, or differential gearing to give motion to such plungers.

A.D. 1875, January 8.—No. 74.

WINDER, Robert, of Bolton, in the county of Lancaster, solicitor.—"Improvements in distributing "type, and in apparatus or appliances therefor."

This invention relates to the automatic distribution of type, and consists :—

First. In the direct extraction of types from a reservoir on to a rotating table by means of a pin or pins.

Second. In employing retaining springs for preventing more than one type being extracted from the reservoir at a time.

Third. In retaining types on a rotating table by means of catches which are withdrawn whilst passing a reservoir.

Fourth. In making use of a feeler and hook to select and withdraw types from the rotating table. The feelers or hooks are provided with projections and the types with indentations.

Fifth. In combination with the above fourth head using an inclined plane or precipice to turn types from their flat to their edge.

A.D. 1875, January 8.—No. 75.

EDWARDS, Edmund, of the firm of Edwards and Co., 38, Southampton Buildings, Chancery Lane, in the county of Middlesex, engineers and patent agents.—(*A communication from Alfred Bernard Boullenot, the elder, of Paris, France.*)—" Improvements in safety lamps."

This invention consists in replacing the Davy or safety lamps ordinarily used in mines containing fire damp by improved lamps supplied with air from outside the mine. For this purpose a fixed pipe or pipes is conducted down the mine, and branches from it are led into all the workings. Compressed air is forced down the pipe by means of air pumps worked at the surface, and the improved lamps are screwed to the air pipes where necessary by means of couplings and straight or elbow pipes provided with stopcocks.

The improved lamp consists, first, of a metal air vessel which receives the compressed air, and into the upper part of which an oil vessel drops, fitted with a burner, and a wick (either flat or tubular) which can be raised or lowered by means of a knob outside the lamp. This knob can be disconnected from the oil vessel when it is required to remove the latter. Above the air vessel is cemented a tube or cylinder of glass or crystal, the upper end of which has fitted round it a metal ring carrying a cover formed of two pieces of wire gauze a short distance apart. The glass cylinder is protected by a cage of sufficiently strong metal bars. A reflector is provided carried by a ring fitting round the air chamber and moveable into any desired position. Through the centre of the gauze cover an opening is left which can be closed by a stopper, and through this opening a light can be introduced consisting of a tube or sheath containing an inner spring clip, which can be raised or lowered by a ring or handle at the top of the tube from outside the lamp. This spring clip carries a match, which can be ignited by rubbing its end upon a rough surface prepared for the purpose at the top of the oil vessel.

When the match is ignited the lamp wick is lighted from it, and the match is then extinguished by drawing the spring clip into the tube, which can then be removed from the lamp, the opening in the cover being closed by its stopper; and the lamp will then continue burning so long as the supply of oil and of air continues. A valve may be provided in the cover.

When necessary this improved lamp may be screwed to a portable receiver of compressed air or oxygen, instead of to a fixed air pipe.

A.D. 1875, January 8.—No. 76.

WILSON, Matthew, and **McLAY**, Joseph Corrie Struthers, both of 79, Queen Street, Cheapside, in the city of London, **WARREN**, Captain Frederick Pelham, of the Royal Navy, of East Court, Cosham, Hants, and **BRODIE**, William, newspaper writer, of 28, Ballance Road, Hackney, Middlesex. " Improvements in the manufacture of railway wheels and axles."

Our invention relates to an improved manufacture of railway wheels and axles, and its main object is to so construct a wheel or axle that the existence of any flaw or imperfection caused by the crystallization or polarization of the metal in any part of the same may be detected.

A.D. 1875, January 8.—No. 77.

WELDON, Christopher John, of San Jose, in the county of Santa Clara, and state of California, one of the United States of America, gentleman.—" Improvements in clasps or buckles."

My invention relates first to a suspension-buckle consisting essentially of three pieces, a buckle-top, a tongue, and a body-piece. Secondly, to an adjustable tab, fitted to the end of the suspender.

A.D. 1875, January 8.—No. 78.

LŒWENSTEIN, David, of the town of Nottingham, lace manufacturer, and **WARD**, Samuel, of North Street, in the parish of Sneinton, in the county of Nottingham, machinist.—" Doubling, " twisting, and winding silk, cotton, and other threads, as well from the cop as from the bobbin, with " a stop motion and without spindles, bands, or flyers."

According to this Provisional Specification the bobbins or cops to be doubled, twisted, and wound, are mounted on a holder on a vertical axis, which is rotated, and the threads are led away to a receiving bobbin, which is driven so as to wind up the threads upon it. There are fingers on the revolving holder which are supported by the threads; and when a thread breaks the finger falls and comes in contact with a lever, which throws both the holder and the receiving bobbin out of gear with the driving mechanism.

A.D. 1875, January 9.—No. 79.

LINGWOOD, Edward, of Littleborough, in the county of Lancaster.—"Improvements in the truction of bearings for upright shafts."

invention is designed principally as a substitute for the footstep or bearing hitherto used for ng the lower end of the upright shaft used in mills or manufactories to communicate the power engine to the horizontal shafting on the different floors, but it is equally applicable to the fts or spindles of turret clocks and wherever a heavy vertical shaft or spindle is required pon a support at the lower end.

A.D. 1875, January 9.—No. 80.

iam, of Dunfermline, in the county of Fife, North Britain, engineer.—"Improvements aks and in the method of working the same, in part applicable to other railway breaks carriages."

this invention consists,—

suspending break blocks in slings attached to the carriage framing and in operating the by toggle struts, pulling rods, and levers, raised by bellows, pans, or chambers, attached thereto.

2nd. Obtaining power for working the above as a continuous break by forcing compressed air along tubes. The air is compressed by the action of the pistons of the engine after the steam is shut off, or by using an injector with high-pressure steam and condensing the steam into a receiver, or by fitting auxilliary apparatus on the van to obtain compressed air by pumping it into expansible holders.

3rd. Obtaining the power by exhausting the air from the tubes instead of compressing it.

A.D. 1875, January 9.—No. 81.

BUTLER, Thomas, of the town and county of the town of Nottingham.—" Improvements in fabrics " made on the lever's lace machine."

The inventor produces embossed spots or other shape embossments on the bobbin fining or cloth work of fabrics made on the lever's lace machine in the following manner. If a four bobbin spot is required each bobbin thread has a left twisted cotton or yarn thread worked round it and three right twisted threads, one in the back of the reverse twisted thread and two in the front; the back one may be operated to run down either gate under the spot; the two front ones rise and fall over the bobbin threads three or four gates each; the four left twisted threads and the two front right twisted threads are weighted with springs and operated by the jacquard.

A.D. 1875, January 9.—No. 82.

WILLIAMSON, Christopher, of Leighton Buzzard, in the county of Bedford.—" Improvements in " stays and corsets."

This invention mainly relates to a combination of straw plait or other similar plaited material with woven fabric in the construction of stays or corsets.

A.D. 1875, January 9.—No. 83.

STERNE, Louis, of 9, Victoria Chambers, in the city of Westminster, engineer.—" Improvements in " railway couplings."

This invention relates to those railway couplings in which the draw head is formed at the front with a cavity to receive the coupling link of the adjoining carriage, and in which, by the entrance of the said link a vertical bolt or pin is freed from the device which holds it up and immediately falls into and secures the link. And the invention consists in the employment, for the purpose of holding up the bolt or pin, of a ball or of a roller working freely on an incline at the back part of the cavity in the draw head.

A.D. 1875, January 9.—No. 84.

AYTON, Phinehas Edward, of Birmingham, in the county of Warwick, accountant clerk.—" Improvements in attaching door and other knobs to spindles."

According to this invention a screw box, the exterior of which is formed into a toothed wheel, is enclosed and works in a hollow mount or hollow shoulder of the moveable knob, the screw box taking onto the screwed end of the spindle. In the edge of the hollow mount a tooth or click is jointed, which click when shut down engages with the toothed periphery of the screw box and locks or prevents the rotation of the screw box on the spindle.

By lifting the tooth or click the screw box is released, and by means of a pointed instrument passed through the slot in which the click works, the screw box may be turned and the knob adjusted on the spindle, the adjusted knob being fixed by shutting down the tooth or click.

A. D. 1875, January 9.—No. 85.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Arthur H. Lowerre, and Theodore M. Tucker, both of Newark, New Jersey, United States of America.*)—" Improvements in machinery or apparatus for goffering, crimping, or fluting."

This invention relates to machinery or apparatus to be employed for goffering, crimping, or fluting, trimmings and other fabrics and articles, and it consists of an improved arrangement and combination of the parts whereby great simplicity of construction is obtained and increased facility is offered for adjusting the pressure upon the rollers and for the insertion of the fabric or article to be operated upon.

A.D. 1875, January 9.—No. 86.

BAKER, John Morcombe Bromley, of Southsea, in the county of Hants.—" An improved method and " apparatus for drying steam boilers."

The feature of novelty of this invention consists in drying empty boilers by means of a current of hot air obtained by forcing the said air by means of bellows through a heated pipe connected with a portable stove placed between the said bellows and the boiler, and subsequently injecting therein hot air or steam saturated with grease.

A.D. 1875, January 9.—No. 87.

FAWCETT, Stephen, of Blackburn, in the county of Lancaster, cotton mill manager's assistant.— " Improvements in looms for weaving."

This invention has for object the regulating and controlling the warp beam so as to " let off" the warp as required, this object being secured by the use of a spring or springs and apparatus connected therewith in lieu of the weights and levers usually employed.

A.D. 1875, January 9.—No. 88.

FELDMAN, Joseph, of Stewards Street, Brushfield Street, in the county of Middlesex, boot and shoe manufacturer.—" An improved fastening for buttons, and an improved apparatus for fixing the same."

The improved fastening is formed with three vertical prongs connected together at the top, and the improved apparatus or tool for applying and fixing the same, consists of a pair of pliers or pincers with jaws of a peculiar construction, and having a third or supplementary jaw and lever or handle for operating a punch for clinching the prongs of the fastening.

A.D. 1875, January 9.—No. 89.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Pasquale Balestrieri, of Naples, in the Kingdom of Italy.*)—" Improved apparatus " for collecting rays of light and heat."

This invention relates to apparatus termed armillary-photo-thermo-collectors or collectors of light and heat applicable to lighthouse apparatus and other useful purposes.

The apparatus consists essentially of a series of concentric conical highly polished metal surfaces arranged either in a plane or portion of a sphere, for collecting and projecting rays of light or heat from a luminous or calorific centre.

With these annular conical reflecting surfaces is sometimes combined a concave mirror placed in rear of the luminous or calorific centre for intensifying the light or heat.

A.D. 1875, January 9.—No. 90.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Henri Colaert, of Poperinghe, Belgium, mechanical engineer.*)—" An improved means for closing and " opening shutters and windows."

This invention describes a means of opening and closing shutters by means of rods having right and left screw threads upon them, the rods being rotated by geared wheels act upon the screws, which acting on little blocks fold up the flaps of the shutters hinged together vertically.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 3 to July 9, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, January 11.—No. 95.

ZIMMERMANN, Jacob Friedrich, of 21, Red Lion Square, in the county of Middlesex, and Hanau, in Prussia.—"Improvements in candle-holders."

These improvements relate to candlesticks, candelabra, and candle-holders generally, whether attached to or removable from the ordinary support, and consists in slipping over the upper part of the pillar of the candlestick a metallic cylinder which is notched or slitted at its edge so as to form a spring or number of springs capable of being compressed together towards a common centre. The compression is produced by screwing down on the exterior of the candlestick a collar having at its upper part an interior flange, which, as it is turned round, causes the spring or springs to converge and grip anything placed between them. A candle therefore so placed, is, upon the collar being screwed down, grasped firmly, while, from the shallowness of the socket in which it is gripped, the whole of the candle may be consumed without inconvenience.

The pillars of candlesticks or candelabra may be made as described, or the device may be applied to a plug suitable for insertion in the socket of an ordinary candlestick.

A.D. 1875, January 11.—No. 96.

BOULTON, Matthew Piers Watt, of Tew Park, in the county of Oxford.—"Improvements in engines "worked by hot gases or by hot gases and steam, parts of which improvements are applicable for "generating steam."

This invention relates to engines worked by hot gases or by hot gases and steam, parts of the arrangements described being applicable for generating steam. A double acting cylinder is fitted with a hollow piston having a tubular piston rod in which water is made to circulate. The piston has two packings with a space between them open to the interior of the piston, so that as the latter moves in the cylinder, the water contained in it comes in contact with the interior surface of the cylinder, keeping it cool. The cylinder may also be cooled by water in a jacket surrounding it. The steam generated in the jacket and piston is collected in a steam chest, and employed to work in the same cylinder or in another cylinder. Fuel and air are pumped into the cylinder and ignited therein performing work by driving the piston and generating steam, or for generating steam only, the fuel and air may be drawn into the cylinder, the piston being moved by the steam power, in which case several cylinders may be arranged in one line with their pistons on one tubular rod. The products of combustion may be discharged from the cylinder through regenerators, through which alternating therewith, the fuel and air may pass to the cylinder receiving heat.

A.D. 1875, January 11.—No. 99.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Paul Bontemps, of Paris, France.*)—"An improved hydrostatic motor."

The motor is composed of a pair of cylinders whose pistons are connected to a crank shaft, their reciprocating motion being obtained by causing a column of liquid to alternately exert its pressure in a chamber communicating with each cylinder, for moving the pistons forwards, while the return movement when the pressure is cut off is effected by an expanding and contracting chamber disposed within the water chamber.

A.D. 1875, January 12.—No. 107.

WEATHERDON, Baldwin Fulford, of 77, Chancery Lane, in the county of Middlesex, civil engineer. —(*A communication from William Vigné, aîné, of Agen, department Lot et Garonne, in the Republic of France.*)—" An improved disinfecting fluid."

This invention consists of a disinfecting liquid formed of sulphate of zinc, acetate of copper, phenic acid, and crystals of baryta.

A.D. 1875, January 13.—124.

GATTY, Frederick Albert, of Accrington, in the county of Lancaster, manufacturing chemist.— " Improvements in preparing certain materials employed in printing and dyeing cotton, fabrics, and " yarns."

My improvements consist in preparing oxidised fatty acids by treating soap or other alkaline compounds of fatty acids with chloride of lime.

A.D. 1875, January 13.—125.

BROOKES, William, of 62, Chancery Lane, in the county of Middlesex, patent and registration agent.—(*A communication from Alfred Charles Hobbs, and Jerome Orcutt, both of Bridgeport, Connecticut, in the United States of America.*)—" Improved metallic cartridges."

The invention consists in forming an annular groove or recess in the re-enforce cup in a cartridge case, by which a space between the exterior surface of the cup and the inner surface of the case is made to prevent the gas penetrating between the cup and case in firing.

A.D. 1875, January 13.—No. 128.

SCOTT, George, of Glasgow, in the county of Lanark, North Britain.—" Improvements in furnaces " used in the manufacture of glass."

The features of novelty which constitute this invention are :—

First. The form of the blocks by which their fracture is prevented.

Second. The construction of that end of the " cupola " or fire chamber next the tank.

A.D. 1875, January 14.—No. 152.

PERRY, Robinson Gale, of the city and county of Dublin, in the Kingdom of Ireland.—" Improvements in drying peat and other substances and in apparatus for accomplishing the same."

The materials in cages running on a tramway enter a long tunnel through a door kept closed except when admitting said cages. Above this end is the chimney shaft. They traverse the tunnel to the other end where the furnace is placed and where abundance of air is admitted. From thence if necessary the materials are carried to an extra dissicating chamber. The details differ materially according to the substance to be treated.

A.D. 1875, January 19.—No. 196.

ALEXANDER, Edwin Powley, of 14, Southampton Buildings, in the county of Middlesex, consulting " engineer.—(*A communication from Rickard Benwell, and George Humphreys, both of Alexandria, Egypt, engineers.*)—" An improved stud or button for fastening the ends of metal bale bands."

This invention relates to a peculiar loose stud or button for bale bands and consists of a button having a shank of square or other section and of a length rather greater than the combined thicknesses of the two overlapping ends of the bale band, through holes in which the loose stud or button is inserted. The shank of the button is disposed eccentrically to the upper and lower heads, the main portions of which project or overhang respectively to the right and left of the shank or vice versa, a very small lip or projection being left on the sides of the shank opposite to the main projecting portions of the heads.

A.D. 1875, January 19.—No. 199.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from George Johnson, of Haverstraw, in the county of Rockland, state of New York, United States of America.*)—" An improvement in machines for rolling bars for nut blanks."

This invention consists in employing a revolving notched clearer in combination with rolls for rolling notched bars, said clearer being geared with the rolls so that its notches will mesh with the bar, thereby avoiding the injury to its corners to which it is subject with an ordinary stationary clearer.

A.D. 1875, January 21.—No. 236.

SCOTT, John Peers, of Manchester, in the county of Lancaster, engineer and exporter of machinery. —(*A communication from John Haag, of Augsburg, in the Kingdom of Bavaria, machinist and tube manufacturer.*)—" Improvements in apparatus for heating and warming railway carriages by steam."

This invention consists in the application of wrought iron tubes welded at both ends, and with a flange in the middle in which the regulating valves are connected. Also in constructing the regulating steam valve so that it can be opened and shut inside the compartments of the carriages. Also in introducing the steam into warming tubes placed under the seats in the carriages. Also in a self-acting valve which is placed between the two carriages. Also in making all the joints of the warming apparatus of solid metal.

A.D. 1875, January 26.—No. 290.

HUNT, Bristow, of Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from Harvey Klapp Flagler, of Boston, Massachusetts, in the United States of America.*)—" Improvements in welding tubes, pipes, and other tubular or circular articles, and in apparatus to be used therein."

The object of this invention is to prevent the round bar and ball used in welding tubes, pipes, and other tubular articles from turning during the welding operation, and also to improve the construction of the ball.

The invention consists, firstly, in holding the bar from turning by constructing it square at its rear end, and passing it between two rollers having V-shaped grooves; and secondly, in a hollow welding ball formed at one end on the interior, with longitudinal lugs arranged to form a bearing on each side of a square shaped shoulder on the front end of the bar.

A.D. 1875, January 26.-No. 296.

WIRTH, Frank, of the firm of Wirth and Company, patent agency, of Frankfort on the Main, in the Empire of Germany.—(*A communication from Josef Lister, manufacturer, a person resident at Vienna, in the Empire of Austria.*)—" Improvements in electric apparatus."

All batteries hitherto constructed, especially those which have to be transported, have the disadvantage that when they were charged they could not be hermetically closed, and that when the elements had to be lifted out a complicate mechanism was necessary. If such batteries were to be transported for some distance the several parts of them and the acid had to be packed in separate vessels. Elements that remain filled during the time when they are not employed consume metals and acids uselessly and are readily spoiled. All these disadvantages are avoided with my apparatus.

A.D. 1875, January 28.—No. 321.

TAYLOR, Robert, of Oldham, in the county of Lancaster, machinist.—" Improvements in machinery for tapping screw threads."

The spindle to which the tap is secured is turned round alternately in opposite directions by a driving strap and three pulleys, one of which is fixed to the spindle and the other is provided with internal teeth gearing into a carrier pinion which drives the spindle.

The strap is moved to and fro over the pulleys by a self acting apparatus actuated by a slide.

A.D. 1875, January 28.—No. 329.

BURDESS, Adam, of Coventry, in the county of Warwick, watch manufacturer.—" Improvements in mechanism for working the brakes of railway carriages, wagons, and trucks."

This invention consists of the following mechanism for automatically working the brake blocks when the buffers and buffer springs are brought into operation. On the buffer rod is an arm, the folded end of which embraces the free end of a lever parallel to the buffer rod or cam or "rise" on the said lever, when the buffer rod is pressed inwards drawing the said levers towards the buffer rod. On the said lever is a short horizontal cross lever, the free end of which is nearly in contact with the face of the wheel. When the buffer rod is pressed inwards this cross lever is made to bear against the wheel, which wheel by its onward motion gives motion to the said cross lever, the motion of the latter being transmitted to a cross connecting rod parallel to the axle of the pair of wheels, so as to draw the said cross connecting rod inwards. This cross rod carries a fixed loop, in which loop a pin on a cleat on the buffer rod engages. When the cross rod carrying the loop is drawn inwards by the action of the cross lever the cleat is forced inwards and the brake block brought into operation. The cross lever is made to operate cleats on the buffer rods at both ends of the carriage, so as to simultaneously work the brake blocks of all the wheels of the carriage.

A.D. 1875, July, 5.—No. 2433.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Richard Kitson, of Lowell, Massachusetts, United States of America.*) —"Improvements in machines for opening and preparing cotton."

The first part of said invention consists in certain improvements in machines for opening cotton and other fibrous substances which relate. First. To a novel method of hanging beater discs so as to avoid strain upon their shaft bearings and cause them to be balanced by each other. Second. To the combination with a single delivery spout for the opened cotton of two sets of discs. Third. To the combination of each set of discs of the machine with a revolving screen cylinder for forming the lap. Fourth. To the combination with each set of beater discs of a movable apron for delivering the cotton to the beaters through an inclined receiver or hopper. The second part of said invention relates to the beaters used in machines for opening and beating or preparing fibrous substances and the objects of this part are, First. To make the shaft and arms of the beater lighter in weight. Second. To prevent the cotton from clinging to and clogging the arm of the beater under the blade in accumulations which cause the beater to be out of balance. The third part of the said invention also relates to the beater used in machines for opening and preparing cotton or other fibrous substances.

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—— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.

—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of [light and heat.

—— A. M. (*Bontemps*), 99, Jan. 11 (*App.* 2.) Hydro- [static motor.

—— A. M. (*Johnson*), 199, Jan. 19 (*App.* 2.) Rolling [bars for nut blanks.

—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.

—— A. M. (*Taft*), 1153, Mar. 30 (*App.*40.) Table cutlery [and handles.

—— A. M. (*Edge*), 1615, May 1 (*App.*45.) Chain swivels.

—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking [screw nuts.

—— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.* [46.) Hydraulic engines, &c.

—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway [for warehouses.

—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro- [magnetic engines.

—— W., 80, Jan. 9, Railway breaks.

Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8, [Bricks, tiles, &c.

Cleveland Paper Box Machine Co. (Haseltine), 1008, [Mar. 18 (*App.* 38.) Paper boxes.

Clough, W. R. (Haseltine), 1640, May 3 (*App.*45.) Cork- [screws.

Coddington, R. (*Gally*), 1128, Mar. 27 (*App.*40.) Telegraphy.

Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and [windows.

Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers [and other boilers.

Collingwood, E., 79, Jan. 9, Bearings for shafts.

Cramp, A. H., 225, Jan. 22 (*App.* 42.) Stretching boots [and shoes.

Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy- [menageries.

Crocker, S. L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.

Crompton, G. (Morgan-Brown), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.

Cuivre Français, Société Anonyme du (Bousfield), 2042, [June 30 (*App.* 49.) Protosulphuret of iron [and sulphuretted hydrogen gas.

—— (Bousfield), 2084, June 5 (*App.*50.) Kilns or ovens.

D.

Daimler, G. W. (Abel), 71, Jan. 8. Motor engines.

Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary [vessels.

Deacon, G. F., 50, an. 5, Measuring water in pipes.

Dick, A., 55, Jan. 6, Air or gas spring and stuffing box.

Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.

Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.

Dudgeon. A., 33, Jan. 4, Distilling.

Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.

Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.

Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8, [Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.

Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.

Edson, N. T., & Silliman, C. H. (Haseltine), 1677, [May 5 (*App.* 45.) Paddle wheels.

Edwards, E. (*Boullenot*), 75, Jan. 8, Safety lamps.

Ellis, T., 69, Jan. 8, Preparing yeast.

Ellison, J., 30, Jan. 4, Door fasteners.

Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.

F.

Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.

Fawcett, S., 87, Jan. 9, Looms.

Feldman, J., 88, Jan. 9, Button fastenings.

Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c., fibres.

—— W. & J., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c., fibres.

Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9 [(*App.* 33.) Filling and corking bottles.

Fewster, W., 293, Jan. 26 (*App.* 1.) Saving life and [property at sea.

Fielden, I., 17, Jan. 1, Steam-engines.

Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.

Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air [engines, &c.

Fitz, E. E., 187, Jan. 18 (*App.* 30.) Mounting globes.

Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.

Flagler, H. K. (Hunt), 290, Jan. 26 (*App.* 2.) Welding [tubes, &c.

Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing- [machines.

Foster, W. R., 10, Jan. 1, Railway breaks.

Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.

G.

Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele- [graphy.

Gandy, M., 52, Jan. 6, Paper material or substitute for [wood, &c.

Garland, H. P., 229, Jan. 21 (*App.* 30.) Sewing-machines.

—— H. P., 2248, June 18 (*App.*51.) Sewing-machines.

Gally, F. A., 124, Jan. 13 (*App.* 2.) Printing and dyeing [fabrics, &c.

Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.

Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.

Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21 (*App.* 2.) Heating rail-
[way carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3 (*App.* 51.) Indicating
[speed of ships.
Harrison, S. L., 461, Feb. 6 (*App.* 33.) Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4 (*App.* 32.) Balanced
[slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.* 33.)
[Filling and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.*
[33.) Rock drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App* 40.) Burning
[bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.)
[Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
Heard, J. R., 489, Feb. 10 (*App.* 33.) Horse-shoe & other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13
[(*App.* 2.) Cartridges.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Holland, W., & *Myers, H.*, 34, Jan. 4, Umbrellas and
[parasols.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
——— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19
[(*App.* 2.) Bale bands.
Hunt, B. (*Flagler*), 290, Jan. 26 (*App.* 2.) Welding
[tubes, &c.
Hunt, E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.

J.

James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*)
[26, Jan. 2, Printing metals.
Johnson, G. (Clark), 199, Jan. 19 (*App.* 2.) Rolling
[bars for nut blanks.
Johnson, J. H. (*Van Haagen*), 47, Jan. 5, Sharpening
[drills.
——— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer-
[ing, &c.
——— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *J. R., & Harding, G. P.* (Morgan-Brown)
[2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, S. H., 156, Jan. 14 (*App.* 29.) Cocks or valves.
Jones, E., & Bayliss, M., 174, Jan. 16 (*App.* 43.) Nuts and
[washers.
——— R. A., & Perry, J. J., 12, Jan, 1, Lighting cigars, &c.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.
Kendrick, T., 31 Jan, 4, Coffin furniture.
Kennedy, W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23 (*App.* 31.) Boots.
Kidd, J., & *Arnold, L.*, 66, Jan. 7, Gas.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
——— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
——— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
——— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
——— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-
[menageries.
——— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting
[ores ; making iron; furnaces.
——— W. R. (*McClintock*), 2080, June 5 (*App.* 50.)
[Compositions for paving, &c.
——— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather-
[pulp.
——— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing
[electrotype shells.
——— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
——— W. R. (*Bannister & Milligan*), 2245, June 18
[(*App.* 51.) Device for advertising.
Lee J., 131, Jan. 13 (*App.* 29.) Fire-arms.
Leiter, J. (Wirth), 296, Jan. 26 (*App.* 2.) Electric
[apparatus.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Levet, C. (Wise), 3, Jan, 1, Boring rock, &c.
Loemenstein, D., & Ward, S. 78, Jan. 8, Doubling, &c.,
[threads ; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.

Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.
Luckenbach, F. A., 243, Jan. 21 (*App.* 50.) Casting and
[annealing slag.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.)
[Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12 (*App.* 52.) Iron, steel, &c.

M.

McClintock, J. R. (Lake), 2080, June 5 (*App.* 50.) Com-
[positions for paving, &c.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M.,
[76, Jan. 8, Railway wheels and axles.
Mc Vicar D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing
[stones, &c.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.*
[44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
—— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.*
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped
[axles.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8
[(*App.* 51.) Device for advertising.
Milner, E., 54, Jan. 6, Furnaces.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20
[(*App.* 35.) Filtering water.
Moreau, E., 228, Jan. 21 (*App.* 30.) Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20
[(*App.* 35.) Filtering water.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and
[windows.
—— W. (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
—— W. (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of
[type.
—— W. (*Johnson & Harding*), 2250, June 19
[(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-
[way for warehouses.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and
[utilizing steam.
Mullholland, H. (Rogers), 161, Jan. 15 (*App.* 1.) Cut
[nails.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.)
[Sewing-machines.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and
[parasols.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding,
[&c. fibres.

O.

Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13,
[(*App.* 2.) Cartridges.
Outerson, A. & J., 558, Feb. 16 (*App.* 34.) Filters.
—— J. & A., 558, Feb. 16 (*App.* 34.) Filters.

P.

Paper Box Machine Co., The Cleveland (Haseltine),
[1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Peck, J.F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Perry, J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
—— R. G., 152, Jan. 14 (*App.* 2.) Drying peat, &c.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485
[Feb. 9 (*App.* 33.) Rock drills.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13 (*App.* 29.) Driving
[spindles.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2,
[Preparing fibres for spinning.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Pye, R., 70, Jan. 8, Shuttle springs.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank
[or shackle.
Redheffer, W. (Benson), 388, Feb. 3 (*App.* 32.) Freez-
[ing, churning, &c.
Reynolds, G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
—— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14,
[(*App.* 46.) Hydraulic engines, &c.
Rogers, B. W., 300, Jan. 26 (*App.* 1.) Screws, bolts, &c.
—— H. (*Mullholland*), 161, Jan. 15 (*App.* 1.) Cut nails.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting
[ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.

S.

Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.

Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25 [(*App.* 35.) Surfaces for steps, &c.
Scott, G., 128, Jan. 13. (*App.* 2.) Glass furnaces.
—— J. (*Gerard*), 38, Jan. 4, Finishing fabrics, &c.
—— J. P. (*Haag*), 236, Jan. 21 (*App.* 2.) Heating [railway carriages.
Sewing-Machine Co., Hamburg-American (Jensen), 26, [Jan. 2, Printing metals.
Shanks, F., 1507, Apr. 23 (*App.* 43.) Carriages.
Siemens, C. W., 43, Jan. 5, Furnaces.
Silcox, D. S. (Lake), 5, Jan. 1, Kindling fires.
Silliman, C. H., & Edson, N. T. (Haseltine), 1677, [May 5 (*App.* 45.) Paddle wheels.
Simmons, C., 65, Jan. 7, Steam-boilers.
Sington, T., 57, Jan 6, Railway signals.
Smith, J. & R. (Abel), 244, Jan. 22 (*App.* 44.) Steam- [boilers.
—— *R. & J.* (Abel), 244, Jan. 22 (*App.* 44.) Steam- [boilers.
Smythe, E. T. (Haseltine), 422, Feb. 4 (*App.* 32.) [Balanced slide-valves.
Solet, F., & Mathian, V. (Abel), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
Spencer, C. M., 893, Mar. 10 (*App.* 37.) Screws.
Stableford, W., 1098, Mar. 25 (*App.* 39.) Railway wheels.
Sterne, L., 83, Jan. 9, Railway couplings.
Stormont, J. G., 1, Jan. 1, Call-bell and actions.
Stringfellow, H. W., 25, Jan. 2, Drain pipes.
Sutro, H. (Haseltine), 1479, Apr. 22 (*App.* 43.) Device [for holding thread, &c.

T.

Taft, O. W. (Clark), 1153, Mar. 30 (*App.* 40.) Table [cutlery and handles.
Taylor, R., 321, Jan. 28 (*App.* 2.) Tapping screw threads.
Thayer, L. O., 454, Feb. 6 (*App.* 33.) Fire-arms.
Thiery, C. L., 2367, June 29 (*App.* 1.) Watch cases, &c.
Thornley, G., & Buxton, T., 188, Jan. 18 (*App.* 30.) Casks.
—— G., & Buxton, T., 1518, Apr. 26 (*App.* 44.) [Jointing cask staves.
Tildesley, M., 8, Jan. 1, Door bolts.
Tomkins, A. S., 114, Jan. 12 (*App.* 43.) Cooking stoves.
Toppan, D. L., Chapin, G. B., & Meloon, D. C. & H. H. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
Trabue, 661, Feb. 23 (*App.* 35.) Needles.
Tucker, T. M., & Lowerre, A. H. (Johnson), 85, Jan. 9, [Goffering, &c.
Turnock, J., 51, Jan. 5, Steam-engines.

V.

Van Haagen, C. (Johnson), 47, Jan. 5, Sharpening drills.
Vaughan, E. P. H. (*Blot*), 37, Jan. 4, Presses.
Vigné, W. (Weatherdon), 107, Jan. 12 (*App.* 2.) Disin- [fectant.

W.

Wackett, J., 68, Jan. 7, Slaughtering animals.
Ward, S., & Loewenstein, D., 78, Jan. 8, Doubling, &c. [threads; stop motions.
Warren, F. P., Brodie, W., Wilson, M., & McLay, J. C. S., [76, Jan. 8, Railway wheels and axles.
Waugh, J., 15, Jan. 1, Closing and opening bottles.
Wavish, J., 39, Jan. 4, Fire-places.
Weatherdon, B. F. (*Vigné*), 107, Jan. 12 (*App.* 2.) [Disinfectant.
Weber, C. P., & Portait, E. P. E. (Clark), 28, Jan. 2, [Preparing fibres for spinning.
Weldon, C. J., 77, Jan. 8, Clasps or buckles.
Westerby, J., & Broadbent, T., 231, Jan. 21 (*App.* 30.) Valves.
Wheeler, W. F. 1592, Apr. 30 (*App.* 44.) Device for [holding fertilizers, &c.
Whittaker, T., Duxbury, J., & Clayton, J., 73, Jan. 8, [Bricks, tiles, &c.
Wicks, J. F. (Benson), 1199, Apr. 2 (*App.* 40.) Pattern [chains for looms.
Wilcke, H., 4, Jan. 1, Propelling screw steam ships.
Wilkinson, A., 60, Jan. 6, Compounds for paving, fuel, &c.
Williams, H., & Evans, P., 22, Jan. 2, Stoppering bottles.
Williams, I. F. (Benson), 437, Feb. 5 (*App.* 32.) Boots [and lasts.
Williamson, C., 82, Jan. 9, Stays and corsets.
Wilmart, O. J., 1085, Mar. 24 (*App.* 39.) Welding wrought [iron and steel.
Wilson, A. (Lake), 2234, June 17 (*App.* 51.) Steam-boiler valves.
Wilson, M., McLay, J. C. S., Warren, F. P., & Brodie, W., [76, Jan. 8, Railway wheels and axles.
Winchester, E. S., & Phelps, H. W. (Haseltine), 485, [Feb. 9 (*App.* 33.) Rock drills.
Winder, R., 74, Jan. 8, Distributing type.
Wirth, F. (*Leiter*), 296, Jan. 26 (*App.* 2.) Electric [apparatus.
Wise, W. L. (*Levet*), 3, Jan. 1, Boring rock, &c.
—— W. L. (*Kay*), 1461, Apr. 21 (*App.* 43.) Knot-tying [apparatus.
Wollaston, C. J., 58, Jan. 6, Thermo-electro apparatus.
Wright, E., 754, Mar. 2 (*App.* 36.) Transmitting and [controlling motion.
—— M., & Pollard, J., 133, Jan. 13 (*App.* 29.) Driving [spindles.

Y.

Young, Mc C. (Haseltine), 1317, Apr. 10 (*App.* 42.) [Cutting match splints.

Z.

Zimmermann, J. F., 95, Jan. 11 (*App.* 2.) Candle holders.

INDEX OF SUBJECT-MATTER

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX AND SPECIFICATIONS

FROM JAN. 1 TO JAN. 9, 1875, AND TO

APPENDIXES FROM JAN. 10 TO JULY 9, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 29 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 and 2, with the weekly Nos. of the Index for the present year.]

A.

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Lighthouses:
Apparatus for use in, Clark (*Balestrieri*), 89.

Links and shackles:
Shackles or hanks, Ramsay (*Low*), 1956 (*App.* 48.)

Locks; latches; door fasteners:
Door and barrel bolts and staples for same, Tildesley, 8.
Shuts, tumblers, levers, &c. for door latches and, Tildesley, 8.
Latches for doors, casements and shutters, Browning, 23.
Attaching door knobs to spindles, Ayton, 84.

Lubricating. *See* Oiling.

M.

Manure distributors:
Impregnating device for, Wheeler, 1592 (*App* 44.)

Maps:
Mounting and operating globes, Fitz, 187 (*App.* 30.)

Matches; cigar lights; match splints:
Holder for, and means of lighting, Perry & Jones, 12.
Automatic splint cutter, Haseltine (*Young*), 1317 (*App.* 42.)

Mattresses. *See* Upholstery.

Measures for liquids:
In bottling liquids, Haseltine (*Bradford & Ferry*), 484 (*App.* [33.)

Measures for solids:
Paper material for making corn measures, Gandy, 52.

Metal waste (utilising):
Old bale ties & narrow scrap for door bolts, &c., Tildesley, 8.

Metallic salts:
Photosulphuret of iron, Bousfield (*French Copper Co.*), 2042 [(*App* 49.)
Sulphate of iron, Bousfield (*French Copper Co.*), 2042 (*App.* [49.)

Metals (casting). *See* Casting.

Metals (coating). *See* Coating.

Metals (cutting). *See* Cutting.

Metals (forging). *See* Forging and Rolling.

Metals (ornamenting). *See* Ornamenting.

Metals (puddling). *See* Smelting.

Metals (punching). *See* Punching.

Metals (refining and purifying). *See* Smelting.

Metals (rolling). *See* Rolling.

Metals (smelting). *See* Smelting.

Metals (upsetting). *See* Upsetting.

Metals (welding). *See* Forging.

Miners' safety lamps. *See* Lamps.

Motive-power (air). *See* Air and gas engines.

Motive-power (gas). *See* Air and gas engines.

Motive-power (steam). *See* Steam-engines.

Motive-power (water). *See* Water-power engines.

Moulding bricks. *See* Bricks.

Moulding metals. *See* Casting metals.

Moulding plastic materials. *See* Casting, &c.

Music:
- Duplex telephone, Johnson (*Gray*), 974 (*App.* 38.)

Musical instruments:
- Piano-harp cabinet organ, Hunt (*Matthews*), 6.
- Insulating legs of piano-fortes, Miller, 24.

N.

Nails:
- Chisel pointed cut nails, Rogers (*Mullholland*), 161 (*App.* 1.)
- Nail plates for horse-shoe & other nails, Heard, 489 (*App.* 33.)

Needles:
- Swaging and cutting needle blanks, Trabue, 661 (*App.* 35.)

Nuts; washers:
- For fusible plugs of steam-boiler fire-boxes, Clark, 80.
- Lock nut and washer for railway fish bolts, Bayliss & Jones, [174 (*App.* 43.)
- Rolling bars for nut blanks, Clark (*Johnson*), 199 (*App.* 2.)
- Tapping screw threads into washers, Taylor, 321 (*App.* 2.)
- Locking screw nuts, Clark (*Bates*), 1639 (*App.* 45.)
- Securing, on through bolts of rock drills, Reynolds, 2287 (*App.* [52.)

O.

Oil-engines:
- Rotary cellular confined heated, Boyman, 67.

Oiling and lubricating:
- Axles of rotary cellular engines, Boyman, 67.

Oils (mineral):
- Apparatus for distilling, Dudgeon, 33.

Opening cotton, &c. *See* Spinning (batting).

Ornamenting:
- Tinned plates, &c., Jensen (*Hamburg-American Sewing-Ma*[*chine Co.*), 26.
- Coffins and coffin furniture, Kendrick, 31.

Ovens and kilns:
- For heating and cooling slag castings, Luckenbach, 243 (*App.* [50.)
- Brick kilns and heating same, Haseltine (*Bingham*), 1182 [(*App.* 40.)
- For baking bread, meat, &c., Bonneville (*Lesobre*), 1937 [(*App.* 48.)
- Constructing and working brick and other kilns, Bull, 1977 [(*App.* 40.)
- For roasting sulphurous minerals, Bousfield (*French Copper* [*Co.*), 2084 (*App.* 50.)

Oxidation, corrosion and incrustation (preventing):
- In steam-boilers, Scott (*Gerard*), 38.
- In steam-boilers, Morgan-Brown (*Crompton*), 1967 (*App.* 49.)

P.

Packing:
- Compound material or, of asbestos and india-rubber, Fish, 9.
- Rock drill engine cylinders, &c., Haseltine (*Winchester &* [*Phelps*), 485 (*App.* 33.)
- Pistons of rock drills, Reynolds, 2287 (*App.* 52.)

Packing; packing cases:
- Bale band fastener, Alexander (*Benwell & Humphreys*), 196 [(*App.* 2.)
- Card for putting up thread, braid, &c., Haseltine (*Sutro*), 1479 [(*App.* 43.)

Pails. *See* Buckets.

Panels:
- Treating peat, &c. for and making, Wilkinson, 60.

Paper (applications of):
- To ornamenting coffins and coffin furniture, Kendrick, 31.
- To making substitutes for wood, leather, &c., Gandy, 52.
- Paper-stock for filtering, Onterson & Outerson, 558 (*App.* 34.)
- To boxes, Haseltine (*Cleveland Paper-box Machine Co.*), 1008 [(*App.* 38.)

Parasols. *See* Umbrellas.

Pears (press for squeezing). *See* Presses.

Peat and turf:
- Treating, for making paving blocks, fuel, &c., Wilkinson, 60.
- System of drying, Perry, 152 (*App.* 2.)

Petroleum engines. *See* Air and gas engines.

Photo-thermo-collectors (armillary):
- For collecting rays of light and heat, Clark (*Balestrieri*), 89.

Pianofortes. *See* Musical instruments.

Piano-harp cabinet organs. *See* Musical.

Pictures; picture frames:
- Treating peat, &c. for and making frames, Wilkinson, 60.

Pillows. *See* Upholstery.

Pincers and pliers:
- For fixing buttons and fasteners, Feldman, 88.

Pins or bolts. *See* Bolts.

Pipes:
- Material for packing pipe joints, Fish, 9.
- Moulding drain, in Portland cement, Stringfellow, 25.
- Coupling tubes of railway break apparatus, Clark, 80.
- For railway carriage heating apparatus, Scott (*Hagg*), 236 [(*App.* 2.)
- Metallic joint for steam heating, Scott (*Haag*), 236 (*App.* 2.)
- Utilizing slag for sewer and drain, Luckenbach, 243 (*App.* 50.)
- Welding, Hunt (*Flagler*), 290 (*App.* 2.)
- Preventing water freezing in, Chameroy, 417 (*App.* 1.)

Pistons:
- Material for packing stuffing-boxes of piston rods, Fish, 9.
- Arranging, of double-acting gas-motors, Abel (*Daimler*), 71.
- Hollow, for hot-gas and steam-engine cylinders, Boulton, 96 [(*App.* 2.)
- Rock-drill and steam-hammer, Haseltine (*Winchester &* [*Phelps*), 485 (*App.* 33.)
- For superheated steam-engines, Dixwell, 1012 (*App.* 38.)
- Reciprocating, for engines, Bruce & Antisell, 2016 (*App.* 49.)
- Packing and cushioning rock drill, Reynolds, 2287 (*App.* 52.)

Planing. *See* Cutting.

Plants and trees:
- Device for holding and applying fertilisers, &c., Wheeler, 1592 [(*App.* 44.)

Platforms:
- Forming surfaces of, Haseltine (*Keene & Sawyer*), 700 (*App.* [35.)

Polishing:
- Powder for, metallic substances, Wilkinson, 60.

Preserving and preparing food:
- Drying articles of food, Perry, 152 (*App.* 2.)
- Combined egg-beater, freezer, &c., Benson (*Redheffer*), 388 [(*App.* 32.)
- Oven for preparing preserves, Bonneville (*Lesobre*), 1937 [(*App.* 48.)

Presses:
- For squeezing grapes, apples, beet, &c., Vaughan (*Blot*), 37.

Pressing or compressing miscellaneous articles:
- Operating dies in forming eyes upon tools, Chapman, 1823 (*App.* 47.)

Printing metals; transfer printing:
- And ornamenting tinned plates, &c., Jensen (*Hamburg-American Sewing-Machine Co.*), 26.

Printing paper:
- Distributing type automatically, Winder, 74.
- Writing mechanically by means of type, Morgan-Brown [(*Harding & Johnson*), 2119 (*App.* 50.)
- Forming moulds for stereotype plates, Morgan-Brown (*Harding & Johnson*), 2119 (*App.* 50.)
- Backing electrotype shells, Lake (*Brooks*), 2168 (*App.* 51.)

Printing woven and other fabrics:
- Preparing floor-cloths for, Nairn, 35.
- Thickening agent in ("apparature"), Scott (*Gerard*), 38.
- Preparing oxidised fatty acids for use in, Gatty, 124 (*App.* 2.)

Propelling carriages; locomotion on land:
- Rotary cellular engine for, Boyman, 67.

Propelling or driving machinery; transmitting [power or motion:
- Hydro-pneumatic motor for, Fisher & Rutherford, 56.
- Rotary cellular engine for, Boyman, 67.
- Baskets of centrifugal machines, Britten & Barron, 118 (*App.* 1.)
- Spindles in spinning frames, &c., Wright & Pollard, 133 (*App.* [29.)
- Wheel and wedge device for transmitting motion, Wright, 754 [(*App.* 36.)
- Sewing and light machinery, Clark (*Hussey*), 2043 (*App.* 49.)

Propelling ships; locomotion on water:
- Arranging deep and shallow propellers, Wilcke, 4.
- Hydro-pneumatic motor for, Fisher & Rutherford, 56.
- Rotary cellular engine for, Boyman, 67.
- Feathering paddles; working and adjusting same, Haseltine [(*Edson & Silliman*), 1677 (*App.* 45.)

Pulleys and sheaves:
- Shackle for ships' blocks, Ramsay (*Low*), 1956 (*App.* 48.)

Pumps; raising and pumping liquids:
- Compound material for packing stuffing-boxes of, Fish, 9.
- Hydro-pneumatic motor for, Fisher & Rutherford, 56.
- Force pumps for rotary cellular engines, Boyman, 67.
- Compressing water for working railway breaks, Clark, 80.
- Single & double acting, Clark (*Hartwick & Geyer*), 812 (*App.* 36.)
- Hydraulic engines or, Clark (*Rochow & Matthiessen*), 1810 [(*App.* 46.)

Punching and stamping metals:
- Nail-plate for horse-shoe nails, &c., Heard, 489 (*App.* 33.)
- Forming watch chain swivel heads, Clark (*Edge*), 1615 (*App.* [45.)
- Forming eyes upon pickaxes, adzes, hammers, &c., Chapman. [1823 (*App.* 47.)
- Moulding or forming watch-cases, &c., Thiery, 2367 (*App.* 1.)

Pyrometers. *See* Thermometers.

R.

Rafts:
- Using mattresses and pillows as life, Clark (*Peck*), 49.

Railway axles. *See* Axles.

Railway carriages and waggons:
- Preventing accidents to, when axles break, &c., Millbourn, 7.
- Compound material for covering, Fish, 9.
- Self-acting fasteners for waggon doors, Ellison, 30.
- Supporting, when a tyre breaks, Bluck, 72.
- Couplings, Sterne, 83.
- Surfaces for steps of, Haseltine (*Keene & Sawyer*), 700 (*App.* [35.)

Railway carriages (heating). *See* Heating.

Railway signals. *See* Signals.

Railway wheels. *See* Wheels for carriages.

Railways:
- Interlocking signal levers with point levers, Sington, 57.
- Treating peat, &c. for and making sleepers, Wilkinson, 60.
- Lock nuts and washers for fish-bolts, Bayliss & Jones, 174 (*App.* [43.)
- Compound iron and steel rails, Wilmart, 1085 (*App.* 39.)

Ratchet and drill braces:
- Substitute for toothed wheel & pawl of, Wright, 754 (*App.* 36.)

Reaping and mowing machines:
- Crop & ear lifters for raising laid crops, Hughes, 1311 (*App.* 42.)
- Tying knots in binding sheaves, Wise (*Kay*), 1461 (*App.* 43.)

Reels. *See* Bobbins.

Reflectors:
- Light and heat, Clark (*Balestrieri*), 89.

Refrigerators; refrigerating:
- Water in petroleum vapour engines, Abel (*Daimler*), 71.
- Combined freezer or churn & beater, Benson (*Redheffer*), 388 [(*App.* 32.)

Registering, indicating and marking:
- Hand alarm register for tram-cars, &c., Doolittle, 1434 (*App.* 43.)
- Tram-car counters, Morgan-Brown (*Johnson & Harding*), 2250 (*App.* 52.)

Retorts:
- Setting and combining coal gas, Kidd (*Arnold*), 66.

Road-making; foot-paths:
- Treating peat, &c. for & making paving blocks, Wilkinson, 60.
- Utilising slag for blocks, flags and curbing, Luckenbach, 243 [(*App.* 50.)
- Fluid or liquid asphaltum for, Lake (*McClintock*), 2080 (*App.* [50.)
- Using asphaltum in compositions, Lake (*McClintock*), 2080 [(*App.* 50.)

Rock drilling. *See* Boring rock.

Rolling metals:
- Bending and pressing horse-shoes, Lake (*Russell*), 48.
- Bars for nut blanks, Clark (*Johnson*), 199 (*App.* 2.)
- Welding tubes, pipes, flues, &c., Hunt (*Flagler*), 290 (*App.* 2.)
- Ribbed plates for horse-shoe nails, &c., Heard, 489 (*App.* 33.)
- Bars for flapped axles, Abel (*Meunier*), 1433 (*App.* 43.)
- Rolls for rolling blanks for horse-shoes, Pilté, 2072 (*App.* 50.)
- Or bending blanks for horse-shoes, Pilté, 2072 (*App.* 50.)
- Forming watch-cases, &c., Thiery, 2367 (*App.* 1.)

Roofs; roofings:
- Compound material for covering, Fish, 9.
- Fluid or liquid asphaltum for, Lake (*McClintock*), 2080 (*App.* [50.)
- Using asphaltum in compositions, Lake (*McClintock*), 2080 [(*App.* 50.)

Ropes and cords:
- Paper material for, Gandy, 52.

Roving fibres. *See* Spinning (twisting).

S.

Sacks. *See* Bags.

Screw-jacks. *See* Hoists.

Screws; screw-stocks:
- Feeding blanks for turning, worming or nicking, Rogers, 300 [(*App.* 1.)
- Tapping screw threads into washers, &c., Taylor, 321 (*App.* 2.)
- Forming heads of machine screws, Spencer, 893 (*App.* 37.)

Sewing and embroidering; sewing-machines:
For producing French vein & fancy work, Beattie & Blair, 13.
Loop expanding mechanism, shuttles for same, Moreau, 228 [(*App.* 30)
Operating spiral needles in sewing bags, &c. Garland, 229 [(*App.* 30.)
Revolving hook, Murdoch (*Follett*), 1357 (*App.* 42.)
Electro magnetic engine for driving, Clark (*Hussey*), 2043 [(*App.* 49.)
Spiral needle machine for, sacks, carpets, &c., Garland, 2248 [(*App.* 51.)

Shafts and shafting for machinery:
Bearings for upright or vertical, Collingwood, 79.

Shears; shearing sheep:
Holding and shearing sheep, Chaquette, 416 (*App.* 32.)
Operating ordinary sheep-shears, Chaquette 416 (*App.* 32.)

Ship and boat building:
Material or paper-felt for, Gandy, 52.
Drying double bottoms of iron ships, Baker, 86.
Internal floating "duck" or vessel, Fewster, 293 (*App.* 1.)

Ships' boats:
Releasing lashings of, Lester & Hallett, 36.

Ships' logs:
Permanent automatic electric log, Hargreaves, 353 (*App.* 51.)

Ships' sails:
Hank or shackle for, Ramsay (*Low*), 1956 (*App.* 48.)

Shoeing horses. *See* Horse-shoes.

Shoes and boots. *See* Boots.

Shutters:
Latch or fastening for, Browning, 23.
Opening and closing folding, Morgan-Brown (*Colaert*), 90.

Sieves. *See* Sifting.

Sifting:
Paper material for making sieves, Gandy, 52.
Bolting flour, Lake (*Martin*), 949 (*App.* 38.)

Signals; communicating apparatus (miscellaneous):
Electric alarm for steam superheaters, Dixwell, 1012 (*App.* [38.)

Signals; communicating apparatus (railway):
Signalling to drivers the breaking of axles, &c., Millbourn, 7.
Constructing, arranging and working, Sington, 57.
Giving notice to drivers to apply breaks, &c., Clark, 80.
Calling attention of guard and others to danger, Boulton, 311 (*App.* 1.)

Slag or scoria (utilising):
For lining furnaces, Siemens, 43.
Casting and annealing, for various purposes, Luckenbach, 243 [(*App.* 50.)

Slaughtering; slaughter houses:
Instrument or apparatus for, Wackett, 68.
Disinfecting or cleansing floors, Wheeler, 1592 (*App.* 44.)

Smelting, reducing and refining metals; treating [ores:
Constructing and working furnaces, Siemens, 43.
Producing ferro-manganese or cast steel, Siemens, 43.
Producing iron, &c. from their ores, Lyttle, 105 (*App.* 52.)
Producing malleable iron and steel, Lyttle, 105 (*App.* 52.)
Refining molten metals by aëration, Lyttle, 105 (*App.* 52.)
Copper ores and pig copper by adding zinc slag, Crocker, 768 [(*App.* 36.)
Extracting copper, Bousfield (*French Copper Co.*), 2042 (*App.* [49.)
Furnaces for puddling, heating and, Lake (*Rogers*), 2045 [(*App.* 49.)
Process of puddling, heating &. Lake (*Rogers*), 2045 (*App.* 49.)
Kiln for roasting sulphurous minerals, Bousfield (*French Cop- [per Co.*), 2084 (*App.* 50.)

Smoke prevention; burning and consuming smoke:
In grates, stoves and furnaces, Wavish, 39.
In steam-boiler and other furnaces, Milner, 54.
In steam-boiler furnaces, Abel (*Smith & Smith*), 244 (*App.* 44.)

Sowing seed:
Combined sower & extirpator or grubber, Gedge (*Dufour*), 20

Spindles; spindles and flyers:
Steadying flyers and bobbin spindles, Kennedy & Acheson, 40.
Bearings for vertical shafts or, Collingwood, 79.
Driving, in spinning frames, Wright & Pollard, 133 (*App.* 29.)

Spinning (batting, opening, ginning and cleaning [fibres):
Superseding batting, Clark (*Portait & Weber*), 28.
Opening and batting cotton, &c., Haseltine (*Kitson*), 2433 [(*App.* 2.)

Spinning (carding, combing and heckling fibres):
Screw and chain gill apparatus, Bonneville (*Martin*), 2.
Carding & gilling worsted, silk, flax, &c., Fenton & others, 14.
Substitute for carding, Clark (*Portait & Weber*), 28.

Spinning (twisting, drawing, slubbing, roving and [doubling fibres:
Forming rovings direct from carding-engine, Fenton & others, 14.
Twisting machine regulator, Sauvée (*Rolin & Guitard*), 21.
Steadying flyers and bobbin spindles, Kennedy & Acheson, 40.
Weighting top and delivery rollers, Kennedy & Acheson, 40.
Working copping or building rails, Kennedy & Acheson, 40.
Doubling, twisting and winding, Loewenstein & Ward, 78.
Stop motion for winding machinery, Loewenstein & Ward, 78.
Driving spindles, Wright & Pollard, 133 (*App.* 29.)

Spools. *See* Bobbins.

Spoons and ladles:
Table rest for, Cave, 571 (*App.* 34.)

Springs:
Air or gas, Dick (*Giffard*), 55.
For shuttles used in weaving, Pye, 70.

Stables; cattle sheds:
Disinfecting or cleansing floors of, Wheeler, 1592 (*App.* 44.)

Stays and corsets:
Using straw or tuscan plait, &c. for, Williamson, 82.

Steam-boiler furnaces. *See* Furnaces.

Steam-boilers (cleansing; preventing incrustation [in: cleaning tubes):
Preparation for ("apparature"), Scott (*Gerard*), 38.
Drying and coating, with fat when out of use, Baker, 86.
Arranging mud collector, Abel (*Smith & Smith*), 244 (*App.* 44.)
By preventing sediment in feed-water, Mosman, 751 (*App.* 36.)
Anti-incrustation battery, Morgan-Brown (*Crompton*), 1967 [(*App.* 49.)

Steam-boilers (generating and superheating steam):
Material for packing man-hole or joints of, Fish, 9.
Utilising waste heated air in, Fisher & Rutherford, 56.
Preventing priming in, Simmons, 65.
Cylinder and piston combination for, Boulton, 96 (*App.* 2.)
For warming railway carriages, Scott (*Haag*), 236 (*App.* 2.)
Arranging and setting in tiers, Abel (*Smith & Smith*), 244 [(*App.* 44.)
Arranging, for utilising exhaust steam, Mosman, 751 (*App.* 36.)
Arranging and preventing priming, Alison, 957 (*App.* 47.)
For producing and cooling superheated steam, Dixwell, 1012 [(*App.* 38.)
Regulating temperature of superheated steam, Dixwell, 1012 [(*App.* 38.)
Multitubular; superheater; setting same, Hessel (*Pregardan*) [1636 (*App.* 45.)

Steam-boilers (water-feeding; heating feed-water):
Arranging feed-water heater, Abel (*Smith & Smith*), 244 [(*App.* 44.)
Reconverting exhaust steam and heating same, Mosman, 751 [(*App.* 36.)

Steam-engine cylinders. *See* Cylinders.

Steam-engines (locomotive, marine and stationary)
Material for packing steam chest covers, Fish, 9.
Reciprocating, for saving steam and power, Fielden, 17.
Or fly-wheel revolved by steam impinging on it, Turnock, 51.
Rotary cellular fuel saving, Boyman, 67.
Combined hot gas and, Boulton, 96 (*App.* 2.)
Steps for locomotives, Haseltine (*Keene & Sawyer*), 700 (*App.* [35.)
Using superheated steam expansively in, Dixwell, 1012 (*App.* [38.)
Variable cut-off for superheated steam, Dixwell, 1012 (*App.* 38.)
For actuating paddles, Haseltine (*Edson & Silliman*), 1677 [(*App.* 45.)
To avoid dead points, &c., Bruce & Antisell, 2016 (*App.* 40.)

Steels. *See* Knives.

Stone:
Breaking and crushing stones, Bradley & Madderson, 63.

Stop-motions:
For broad or small-ware looms, Burlock (*Chapman*), 59.
For thread winding machinery, Loewenstein & Ward, 78.
For screw cutting machines, Taylor, 321 (*App.* 2.)

Stoppers for bottles. *See* Bottle stoppers.

Stoves. *See* Fire-places.

Stuffing-boxes:
Compound material for packing, Fish, 9.
For air or gas springs, Dick (*Johnson*), 55.
Water, for rotary cellular engines, Boyman, 67.
For pistons of rock drills, Reynolds, 2287 (*App.* 52.)

Swivels (watch chain). *See* Jewellery.

Syringes:
Impregnating device for volatile substances, &c., Wheeler, 1592 [(*App.* 44.)

T.

Tar:
Apparatus for distilling, Dudgeon, 33.

Teaching:
Object frame for schools, Haseltine (*McVicar & McVicar*), 27.
Mounting and operating globes for, Fitz, 187 (*App.* 30.)

Telegraphs (electric):
Duplex telephone, Johnson (*Gray*), 974 (*App.* 38.)
Duplex telephone & sounder or printer, Johnson (*Gray*), 974 [(*App.* 38.)
Duplex printing telegraphs, Coddington (*Gally*), 1128 (*App.* [40.)
Electro-magnetic, Bonneville (*Boyle*), 2395 (*App.* 1.)

Telephones. *See* Telegraphs.

Thermo-collectors. *See* Photo-thermo, &c.

Thermo-electric apparatus. *See* Electricity.

Thermometers:
Pyrometric regulator for steam-engines, Dixwell, 1012 (*App.* 38.)
Indicating temperature of superheated steam, Dixwell, 1012 [(*App.* 38.)
Cylinder pyrometer or heat measurer, Dixwell, 1012 (*App.* 38.)

Threads and yarns:
Card for putting up thread, Haseltine (*Sutro*), 1479 (*App.* 43.)

Tickets:
Hand alarm register for tram-cars, &c., Doolittle, 1434 (*App.* 43.)

Tiles:
Moulding and expelling air from, Whittaker & others, 73.

Tilling and cultivating land:
Combined extirpator or grubber & sower, Gedge (*Dufour*), 20.

Tobacco:
Means for lighting cigars, &c., Perry & Jones, 12.

Tools:
Instrument for attaching buttons, Bousfield (*Heaton*), 18.
For making ribs, &c. of umbrellas, Holland (*Myers*), 34.
Sharpening twist bits or drills, Johnson (*Van Haagen*), 47.
Or apparatus for fixing buttons and fasteners, Feldman, 88.
Substitute for ratchet and drill braces, Wright, 754 (*App.* 36.)
Forming eyes upon pickaxes, adzes, &c., Chapman, 1823 (*App.* [47.)

Toys:
Toy menageries, Lake (*Crandall*), 2009 (*App.* 49.)

Tramway carriages:
Compound material for covering, Fish, 9.
Wheel guard or safety apparatus for, Bois, 45.
Rotary cellular engine for propelling, Boyman, 67.
Surfaces for steps of, Haseltine (*Keene & Sawyer*), 700 (*App.* [35.)
Constructing, Morgan-Brown (*Johnson & Harding*), 2250 [(*App.* 52.)

Trimmings:
Goffering, crimping, &c., Johnson (*Lowerre & Tucker*), 85.
Card for putting up braid, ribbons, &c., Haseltine (*Sutro*), 1479 [(*App.* 43.)

Tunnels:
Rock drilling machine, Reynolds, 2287 (*App.* 52.)

Turning:
Feeding screw and nut blanks to machines for, Rogers, 300 [(*App.* 1.)
Barrel of thread spools, Haseltine (*Lyman*), 1781 (*App.* 46.)

Turnstiles:
For tram-cars, Morgan-Brown (*Johnson & Harding*), 2250 [(*App.* 52.)

Type (distributing). *See* Printing.

U.

Umbrellas, parasols and sunshades:
Runners and top notches for, Holland (*Myers*), 34.
Tools, &c. for making ribs & stretchers, Holland (*Myers*), 34.
Paper material for sticks of, Gandy, 52.
Frames, to dispense with spring catches, &c., Charageat, 1046 [(*App.* 48.)

Upholstery:
Life-preserving mattresses and pillows, Clark (*Peck*), 49.

Upsetting metals:
Heel end of horse-shoes, Lake (*Russell*), 48.
Heading chisel pointed nails, Rogers (*Mullholland*), 161 [(*App.* 1.)
Forming watch chain swivel heads, Clark (*Edge*), 1615 [(*App.* 45.)
Forming eyes upon pickaxes, adzes, &c., Chapman, 1823 (*App.* [47.)

V.

Valves (air):
Operating, of rock drilling machines, Wise (*Levet*), 3.
For hydro-pneumatic motors, Fisher & Rutherford, 56.
Rock-drill engine, Haseltine (*Winchester & Phelps*), 485 [(*App.* 33.)

Valves (gas):
Arranging, of gas or petroleum engines, Abel (*Daimler*), 71.

Valves (miscellaneous):
For rotary cellular engines, Boyman, 67.
For railway carriage heating apparatus, Scott (*Haag*), 236 [(*App.* 2.)
Equilibrium cock or valve for high pressures, Johnson, 156 [(*App.* 29.)

Valves (steam):
Material for packing stuffing-boxes of valve rods, Fish, 9.
For rotary cellular engines, Boyman, 67.
Combined cut-off and slide valve, Broadbent & Westerby, 231 [(*App.* 30.)
For railway carriage heating apparatus, Scott (*Haag*), 236 [(*App.* 2.)
Balanced slide-valves, Haseltine (*Smythe*), 422 (*App.* 32.)
Rock-drill engine, Haseltine (*Winchester & Phelps*), 485 [(*App.* 33.)
Safety, coned on under side, for boilers, Alison, 957 (*App.* 47.)
Variable cut-off, for superheated steam, Dixwell, 1012 (*App.* 38.)
Steam loaded safety, for boilers, Lake (*Wilson*), 2234 (*App.* 51.)

Valves (water):
For hydro-pneumatic motors, Fisher & Rutherford, 56.
Safety, for thermal hydro motors, Boyman, 67.
Arranging, for applying railway breaks, Clark, 80.
Regulators for hydrostatic motors, Clark (*Bontemps*), 99 [(*App.* 2.)
For hydraulic presses, Clark (*Rochow & Matthiessen*), 1819 [(*App.* 46.)

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CHRONOLOGICAL AND DESCRIPTIVE INDEX
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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 10 to January 16, 1875.

A.D. 1875, January 11.—No. 91.

MACKAY, George, of Edinburgh, in the county of Midlothian, North Britain, manufacturing chemist.—"Improvements in purifying liquids, in obtaining or preparing the purifying agents, in recovering, treating, and utilizing matters contained in such liquids, as well as other waste, or bye-products of manufacturers, and in means or apparatus employed therefor."

The features of novelty which constitute this invention are purifying liquids by a solution of per-salts of iron (with or without the addition of sub-salts) and alkali or alkaline earth, utilizing the impurities precipitated from the liquids as well as other waste or bye-products, and obtaining a per-salt of iron.

A.D. 1875, January 11.—No. 92.

ATKINS, Robert, of the "Jerusalem," Cowper's Court, Cornhill, in the county of Middlesex, master mariner.—"Improvements in the construction, rig, and equipment of life-boats, rafts, and other vessels, and in means for lowering and launching the same."

The improvements consists in the construction of life-boats or rafts for the use of vessels; the life-boat is made in two peices hinged together and capable of being closed, and carrying sails, masts, and other appliances for working the boat, and provisions, water, lamp, and distilling apparatus with liquid fuel, &c., all of which can be closed and protected from injury in the vessel and easily available when required for use.

The raft is made in three peices hinged together, which when folded and closed form one block, and in which state it can be utilized [*for various purposes*[*]] when not required for use as a raft.

The launching of the life-boat or raft is provided for in the vessel by the construction of a turn table on deck on which the boats or rafts are stowed.

The davits of the vessel are made to lower down at their heads, and are made to return to their original position after the boats are detached from them.

A.D. 1875, January 11.—No. 93.

MACKENZIE, John Ford, of Quadrant Chambers, Wigan, in the county of Lancaster.—"Improvements in the construction of hot-air apparatus for warming buildings and other structures."

A portion of the shell of the cast-iron stove or apparatus is constructed with a series of hollow pyramidical or cone shaped projections. The heat and flame impinging upon the internal, and the cold air upon the external face of these projections.

The stove is also intersected by hollow cast iron tubes or passages, having internal ribs or flanges protruding inwards, and with or without corresponding grooves externally. Cold air to be heated passes through these tubes or passages.

Between the chamber containing the stove, and the outlets which convey the warmed air to the building intended to be heated, a perforated screen or mid-feather is placed, so constructed of fireclay as to present a large extent of that material to the action of the heated air, in its exit from the apparatus. And on the side of this screen furthest from the stove, is a cold-air inlet, with valve or damper, to regulate the admission of cold air, when required to incorporate with the warmed air.

A.D. 1875, January 11.—No. 94.

ROWLAND, Ellis, of the city of Manchester, mechanical engineer.—"Improvements in and apparatus for compressing air and for raising and forcing liquids by the air so compressed or by

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[*] The words "for various purposes" are found in the copy of the Abridgment delivered by the Applicant, but do not appear in the original Abridgment.

[No. 3.] *Price 4d.* F

" steam pressure, which improvements are partly applicable to measuring and indicating the quantity " of liquid passing through the apparatus."

The features of novelty in this invention consist of a peculiar construction of air pump having the inlet valve fitted in the hemispherical end of the piston which is always surrounded by water or other liquid in order to insure that the cylinder shall be completely emptied of air at each and every stroke of the piston,—and in the arrangement and construction of what is called a receiver into which the liquid to be raised or forced gravitates—such receiver being fitted with inlet and outlet valves worked by a tumbler action, and with a float which being connected to counting mechanism so indicates the quantity passing through the receiver.—The liquid being raised from the receiver by the pressure of air or by steam pressure.

A.D. 1875, January 11.—No. 95.

ZIMMERMANN, Jacob Friedrich, of 21, Red Lion Square, in the county of Middlesex, and Hanau, in Prussia.—"Improvements in candle-holders."

These improvements relate to candlesticks, candelabra, and candle-holders generally, whether attached to or removable from the ordinary support; and consists in slipping over the upper part of the pillar of the candlestick a metallic cylinder which is notched or slitted at its edge, so as to form a spring or number of springs capable of being compressed together towards a common centre. The compression is produced by screwing down on the exterior of the candlestick a collar having at its upper part an interior flange, which, as it is turned round, causes the spring or springs to converge and grip anything placed between them. A candle therefore so placed, is, upon the collar being screwed down, grasped firmly, while, from the shallowness of the socket in which it is gripped, the whole of the candle will be consumed without inconvenience.

The pillars of candlesticks or candelabra may be made as described, or the device may be applied to a plug suitable for insertion in the socket of an ordinary candlestick.

A.D. 1875, January 11.—No. 96.

BOULTON, Matthew Piers Watt, of Tew Park, in the county of Oxford.—"Improvements in engines " worked by hot gases or by hot gases and steam; parts of which improvements are applicable for " generating steam."

This invention relates to engines worked by hot gases or by hot gases and steam, parts of the arrangements described being applicable for generating steam. A double acting cylinder is fitted with a hollow piston having a tubular piston rod in which water is made to circulate. The piston has two packings with a space between them open to the interior of the piston, so that as the latter moves in the cylinder, the water contained in it comes in contact with the interior surface of the cylinder, keeping it cool. The cylinder may also be cooled by water in a jacket surrounding it. The steam generated in the jacket and piston is collected in a steam chest, and employed to work in the same cylinder or in another cylinder. Fuel and air are pumped into the cylinder and ignited therein, performing work by driving the piston and generating steam; or for generating steam only, the fuel and air may be drawn into the cylinder, the piston being moved by the steam power, in which case several cylinders may be arranged in one line with their pistons on one tubular rod. The products of combustion may be discharged from the cylinder through regenerators, through which alternating therewith, the fuel and air may pass to the cylinder receiving heat.

A.D. 1875, January 11.—No. 97.

ROWLEY, John, of Camberwell, in the county of Surrey.—"Improved means or apparatus for " preventing splashing when walking."

This invention relates to improvements in the method of constructing and applying guards or shields around the heels and soles of boots and shoes to protect the wearer from splashing the clothes when walking in muddy or dirty streets or places.

For this purpose a guard or shield is attached or applied usually to the back part of the heel of a boot or shoe, although such shield may, if desired, be applied around the sole also.

A.D. 1875, January 11.—No. 98.

JENKINSON, Michael, of Grantham, in the county of Lincoln.—"Improvements in fastenings for " boots, shoes, leggings, and other articles."

The invention consists in forming one part of the fastening of a plate with a hole therein to receive the other part of the fastening which is in the form of a hook to enter the hole in the plate or to pass over one edge thereof; this portion of the fastening being formed with a spring stop to prevent the two parts of the fastening from becoming accidentally disconnected.

A.D. 1875, January 11.—No. 99.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Paul Bontemps, of Paris, France.*)—" An improved hydrostatic motor."

The motor is composed of a pair of cylinders whose pistons are connected to a crank shaft, their reciprocating motion being obtained by causing a column of liquid to alternately exert its pressure in a chamber communicating with each cylinder, for moving the pistons forwards, while the return movement when the pressure is cut off is effected by an expanding and contracting chamber disposed within the water chamber.

A.D. 1875, January 12.—No. 100.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Mellen Bray, of Boston, Massachusetts, United States of America.*)—" Improvements in rivets and machinery for manufacturing the same; which improvements also relate to a method of and machinery for inserting the said rivets in leather or other material."

This invention relates to an improved rivet, and consists in constructing the rivet with a hollow or tubular shank or body. It also relates to a machine for performing the operations of cutting a blank from a coil of wire forming on one end a head, and on the opposite end a conical recess or countersink; and to a machine for drilling out the body of the rivet. It also relates to the manner of setting the tubular rivets herein described. And to a machine for setting the rivets.

A.D. 1875, January 12.—No. 101.

FYFE, David Adam, and **BOWERS, William Hadfield**, both of Manchester, in the county of Lancaster.—" Improvements in the method of and in apparatus for producing gas or gases for heating and for illuminating purposes."

The inventors feed coal-dust or other gas producing substances into a flat bottom retort, in which a chain of travelling scrapers work. For some purposes the gas is subsequently passed through highly heated retorts.

A.D. 1875, January 12.—No. 102.

FLITCROFT, Thomas, of Cutgate, Rochdale, in the county of Lancaster.—" Improvements in the construction of carding engines."

This invention relates to the construction of carding engines used for carding cotton and other fibrous substances; and consists of an arrangement of mechanism applied to the " coiler " for the purpose of lowering the pinion which drives the doffing cylinder of the carding engine out of gear, and thus stopping its revolution whenever a sliver breaks.

A.D. 1875, January 12.—No. 103.

HOWITT, Thomas, agent, of Spring Gardens, Bradford, in the county of York, and **WALKER, Stephen**, and **GIBSON, James**, aërated water manufacturers, of Shipley, in the county aforesaid.—" Improvements in stoppering bottles and other similar articles."

This invention relates to employing a tap fitted in the neck of the bottle or vessel, enabling the filling, closing, and emptying of the same.

A.D. 1875, January 12.—No. 104.

FRANCE, William Henry, of Bradford, in the county of York, wool comb maker.—" Improvements in circular combs and other combs employed in combing wool and other fibres."

This invention relates to constructing combs with a double set of teeth or pins made flat at the base, tapering to a point, or round and tapering; the teeth are fitted first in a row in a metal plate, and other similar teeth or pins are fitted next to them between the spaces touching or nearly touching the teeth until the taper ends leave spaces for the fibres to pass through, producing combs with a number of points and spaces to the lineal inch.

A.D. 1875, January 12.—No. 105.

LYTTLE, William Alexander, of Woodstock Lodge, The Grove, Hammersmith, in the county of Middlesex, civil engineer.—"Improvements in means and apparatus for producing or manufacturing "iron, steel, and other metals."

The features of novelty are as follows :—

Firstly. The applying to copper, zinc, tin, antimony, and other metals the principle followed in manufacturing iron from crushed or powdered ore intermixed with powdered fuel and fluxes, such intermixed ingredients being consolidated into lumps in accordance with my various Letters Patent of last year for improvements in the smelting of iron.

Secondly. Applying to the above mentioned and other metals the use of the same principle of dealing with powdered and consolidated ingredients without fusion or smelting, in accordance with the principle laid down in the Specification of my Letters Patent numbered 2984 of last year.

Thirdly. The use of a peculiar aerating apparatus as the means of refining the various metals smelted by this process, and also of converting the reduced or smelted iron made by this process into malleable merchant iron or steel.

Fourthly. The use of powdered iron produced by this process as the means of reducing or smelting the ores, oxides, sulphides, or chorides of various other metals, with or without the admixture of carbonaceous matter.

A.D. 1875, January 12.—No. 106.

DE BURGH, Frederick Augustus, of 49, Beaumont Square, Mile End Road, in the county of Middlesex.—"Improvements in pipes for smoking; which improvements are also applicable to cigar "tubes and cigarette tubes."

I accomplish this by the following means :—

The bowl and smoke tube are made in the ordinary way. I then bore or drill two air tubes or passages parallel with but quite independent of the smoke tube and running from the front end underneath the bowl, which tubes or passages may have a square or round end at the mouth piece.

A.D. 1875, January 12.—No. 107.

WEATHERDON, Baldwin Fulford, of 77, Chancery Lane, in the county of Middlesex, civil engineer. —(*A communication from William Vigné, aîné, of Agen, department Lot et Garonne, in the Republic of France.*)—"An improved disinfecting fluid."

This invention consists of a disinfecting liquid formed of sulphate of zinc, acetate of copper, phenic acid, and crystals of baryta.

A.D. 1875, January 12.—No. 108.

HIGGINSON, Andrew, of Liverpool, in the county of Lancaster, engineer.—"Improvements in "motive power engines and in pumps."

This invention relates to motive power engines in which the crank is contained in the piston, such piston having a compound motion ; and consists :—

First. In forming the piston with a tongue working in a well or chamber in the cylinder.

Second. In providing the piston with contact pieces projecting from and across its periphery.

Third. In supplying and cutting off steam by means of a slide-valve operated by the governor.

Fourth. In admitting steam into the well to act on the tongue piece before the end of the stroke.

A.D. 1875, January 12.—No. 109.

RUSSELL, Henry, of Ramsgate, in the county of Kent, gentleman.—"Improvements in means or "apparatus for indicating, recording, or registering the number of articles or garments sent to "laundries, and for other similar purposes."

The apparatus consists of tablets or similar surfaces with graduated dials or sections combined with pointers, indexes, studs, or cursers.

A.D. 1875, January 12.—No. 110.

COLE, Frederick, of No. 24, Victoria Park Road, South Hackney, in the county of Middlesex.—"Improvements in machinery for crushing or reducing to impalpable powder, barytas, cocoas, refined sugar, and similar substances both vegetable and mineral."

This consists of a combination of rollers for crushing the material, scrapers for cleaning the rollers, combs for cleaning the iron bed upon which the material to be crushed is laid, a shovel for removing the crushed material, and a sieve for sifting it before packing. The apparatus may be worked by hand, steam, or water as desired.

A.D. 1875, January 12.—No. 111.

GEE, Walter Mallock, of No. 446, Strand, in the county of Middlesex.—"Improvements in vessels for holding liquids, and in cases or receptacles for the same."

A square or other shaped case is fitted with a vessel having parallel sides, or slightly bellied in section, with apertures for holding a glass gauge upon the outside in a vertical manner for indicating the height of the contents. The vessel has an inclined bottom and is fitted with a draw off tap so arranged that the dregs or sediment can be kept back as desired.

A.D. 1875, January 12.—No. 112.

SELLARS, John Carrington, of Birkenhead, in the county of Chester, manufacturing chemist.—"Improvements in cement."

The kind or class of cement to which this invention relates is that employed for repairing, coating, lining, and setting gas retorts, and other vessels and structures subjected to heat, and is now well known as Sellar's plastic cement.

A good quality is produced by mixing silicious sand and silicate of soda or potash.

An excellent quality is produced by mixing silicious sand, sulphate of baryta, and silicate of soda or potash.

A.D. 1875, January 12.—No. 113.

RIDEAL, Samuel, of Manchester, in the county of Lancaster, engineer.—"A new lattice framework covering for the floors, roofs, and sides of railway carriages, for buildings, and other purposes."

This invention consists of a framework of ribs, and cross pieces of timber, metal, india rubber, or other substances, or combinations of them of any section or size, tubular or solid, straight, circular, or irregular, secured together by bolts or otherwise.

A.D. 1875, January 12.—No. 114.

TOMKINS, Alfred Savill, of No. 29, Ladbroke Square, in the county of Middlesex, esquire.—"Improvements in cooking stoves."

The novelty in this invention consists in the several ovens and boilers being so constructed, as is more particularly mentioned in the Provisional Specification, that the underneath and lateral, as well as the surface heat, are utilized, and that there is every facility for cooking either for a small or large number of people, with a comparatively infinitessimal amount of fuel.

A.D. 1875, January 12.—No. 115.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Almet Reed, and Bartley Thomas Mulligan, both of the city, county, and state of New York, United States of America.*)—"Improvements in knitting hats, caps, and other articles, and in machinery for the same."

The invention relates to the knitting of hats, caps, hat bodies, and other articles, and to machinery for producing the same. The knitting is accomplished by means of machinery having a circular needle ring, each needle employed being supplied with its own thread, and the course of the knitting proceeding through successive oscillations through parts of a circle under the control of adjustable patterns, arranged upon a revolving drum, in such a manner as to govern the extent of the successive oscillatory motions of the needle ring.

A.D. 1875, January 12.—No. 116.

CHADBURN, William, of Liverpool, in the county of Lancaster, optician.—" Improved apparatus " for indicating the direction and speed of revolving shafts, particularly those of marine steam " engines."

In order that the indicator may show only the mean variations in speed, and not by sudden pulsations exhibit every momentary increase of speed, I transmit the motion derived from the engine or shaft to be speeded through a circular mercury box to the mechanism that works the indicator.

A.D. 1875, January 12.—No. 117.

HEAPE, Robert Taylor, junior, of Rochdale, in the county of Lancaster, manufacturer.—" Improve- " ments in condensing carding engines."

This invention consists in an arrangement for preventing strands of material from being broken by the lashing or entanglement of loose fibres.

A.D. 1875, January 12.—No. 118.

BRITTEN, Frederick James, and BARRON, William Samuel, both of 21, Buttesland Street, in the county of Middlesex.—" Improvements in centrifugal apparatus."

The basket of the apparatus is fixed on a vertical axis which has at its upper end a ball or hemisphere. This ball rests in a cup fixed at the end of a tubular axis surrounding the above named axis. The basket and its axis are thus suspended from the cup. The machine is driven by causing the tubular axis to revolve.

A.D. 1875, January 12.—No. 119.

BRINSMEAD, Henry, of Ipswich, in the county of Suffolk, machinist.—" Improvements in rotary " screens and in apparatus in connection therewith."

According to this Provisional Specification screen cylinders are constructed of several helices of wire, and the cylinder so made is cleaned by means of a single helix entering between the spaces of the wires forming the screen cylinder.

A.D. 1875, January 12.—No. 120.

BROWNE, Alexander, of the firm of Brown and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—(*A communication from Foundries and Forges Company, of Terre Noire La Voulte and Bességes, in the French Republic.*)—" Improvements in converting " cast-iron, wrought-iron scraps, old rails, and such like materials into steel or metal having the pro- " perties of steel."

The features of novelty of this invention consist in converting old rails, axles, tyres, and such like materials into steel, or metal having the properties of steel, by melting down in a Siemens-Martin furnace a certain quantity of iron containing less than $\frac{1}{1000}$th. of phosphorus with a proportion of the said old rails, axle tyres, and such like materials, and then throwing into the mass and during the running off fragments of ferro-manganese or ferro-silicium in such quantity that the melted metal shall contain 1°/o in weight of manganese or ½°/o of silicium.

A.D. 1875, January 13.—No. 121.

SMITH, James Henry, of Albion Works, Lansdowne Road, London Fields, in the county of Middlesex. —" Improvements in lock stitch sewing machines."

This invention relates to improvements in the presser, take-up, shuttle and its carriage, feed and loop catch, of lock-stitch sewing machines. The presser is held down by a flat blade spring, the take up is effected by a lever worked by a cam, the shuttle is provided with a spring hook for taking up slack of the under thread, and its carriage is fitted with a lever for holding down the shuttle or for throwing it up by hand, the said lever operating as a retarder of the loop passing over the shuttle when the machine is used for chain stitch. The four motion feed is worked by a vertical and a horizontal lever jointed together, the vertical lever being moved by a crank and having a fulcrum that can be shifted to vary the feed. A loop catch is provided to enter the bulge of the needle thread in front of the shuttle, rendering a pause of the needle unnecessary.

A.D. 1875, January 13.—122.

HOLMES, Richard Rivington, of Windsor, in the county of Berks.—"Improvements in aërated "liquors."

This invention relates to a mixture of aerated liquors with spirits in the same bottle, so that one decanting serves to give the mixed drink of the required proportion and quality.

A.D. 1875, January 13.—123.

CASSON, Thomas, of Portmadoc, in the county of Carnarvon, banker.—"Improvements in hydraulic "engines."

This invention consists in so arranging the trunnion or fulcrum of the beam of a hydraulic engine that the leverage and stroke of the piston and consequently the expenditure of working fluid can be proportioned to the load to be lifted, and that when a load is to be lowered, the descending weight can be made to work the piston so as to pump fluid back to the reservoir or accumulator, thus utilising the brake power.

A.D. 1875, January 13.—124.

GATTY, Frederick Albert, of Accrington, in the county of Lancaster, manufacturing chemist.—"Improvements in preparing certain materials employed in printing and dyeing cotton fabrics and "yarns."

My improvements consist in preparing oxidised fatty acids by treating soap or other alkaline compounds of fatty acids with chloride of lime.

A.D. 1875, January 13.—125.

BROOKES, William, of 62, Chancery Lane, in the county of Middlesex, patent and registration agent.—(*A communication from Alfred Charles Hobbs, and Jerome Orcutt, both of Bridgeport, Connecticut, in the United States of America.*)—"Improved metallic cartridges."

The invention consists in forming an annular groove or recess in the re-enforce cup in a cartridge case, by which a space between the exterior surface of the cup and the inner surface of the case is made to prevent the gas penetrating between the cup and case in firing.

A.D. 1875, January 13.—No. 126.

SMITH, Joseph Nottingham, of Jersey city, in the county of Hudson, and state of New Jersey, United States of America, manufacturer.—"Journal boxes for railway cars."

The features of novelty which constitute my invention are: First, a stop so combined with the two parts of the ball and socket joint as to confine the motion thereof within proper limits. Second, a bearing divided longitudinally and having an open space between the two parts over the axis of the journal, and the combination therewith of a curtain or web of fibrous or other absorbent material hung between the two parts of the bearing, its lower edge nearly or quite touching the journal to take up and equalize the redistribution of any excess of oil on the journal. Third, a stopping-bar to take up or resist any undue endwise motion of the car on its axle, said bar being jointed in or near the middle to facilitate its removal and replacement, and held in place by projections on the housing or box-frame. Oil is conducted to the aforesaid bearings by means of wicks or webs of fibrous or other absorbent material, which take the oil up from a well at the bottom of the housing or box frame by capillary action, and distribute it to the bearing surfaces. Fourth, a notch or opening in said stopping-bar, by means of which the examination of the bearings is facilitated and the amount of wear thereof observed without removing the stopping bar. Fifth, the combination with the oil reservoir in which the reserve of oil is held, and the oil well at the bottom of the housing, of an intermediate chamber attached to said reservoir and having inlet and discharge openings in its sides, which openings are so disposed that the oil is held up in the reservoir by atmospheric pressure and only fed out as needed, whether the car is on a level or an inclined track. Sixth, the combination with said housing and the axle, a plate for excluding dust where the axle enters the housing, said plate being in two parts set in a frame, and held against the axle by the combined action of gravity and a spring enclosed in said frame.

A.D. 1875, January 13.—No. 127.

MAIN, Robert, of Glengarnock Iron Works, in the county of Ayr, North Britain.—"New or improved "apparatus for ascertaining the temperature of hot blasts."

The feature of novelty which constitutes this invention is the arrangement and construction of the apparatus.

A.D. 1875, January 13.—No. 128.

SCOTT, George, of Glasgow, in the county of Lanark, North Britain.—"Improvements in furnaces "used in the manufacture of glass."

The features of novelty which constitute this invention are:—

First. The form of the blocks, by which their fracture is prevented.

Second. The construction of that end of the "cupola" or fire chamber next the tank.

A.D. 1875, January 13.—No. 129.

GREEN, William, of Florence Terrace, St. Laurence, Thanet, in the county of Kent.—"Improvements in the preparation & treatment of soaps, and in combining therewith certain vegetable, "farinaceous, or equivalent natural matters; also in apparatus or means therefor; parts of which "improvements are applicable to other soaps."

This invention consists in the production of soaps possessing emollient and curative properties, by the admixture therewith of a larger percentage than heretofore employed of seaweed or extracts thereof, or similar or equivalent matters, or saponified wheaten flour or similar matters, together with soluble glass, liquid quartz, silicate of soda, or the aqueous solution of any of the chemical or commercial varieties and forms of silicates of soda or potassa, and other ingredients, as rosin, borax, steatite, etc., which while assisting to give firmness to such soaps will not neutralize the properties of the seaweed or equivalent matters employed; also the production for such purposes of a saponaceous fluid or paste, by the admixture with seaweed or equivalent matters of ingredients as before described, together with saponified or partially saponified farinacious vegetable, animal, mineral, bituminous, or other cheap or refuse saponifiable matter. Several processes are described shewing special modes of applying the invention to ordinary household soaps, also to perfumed, coloured, medicated, farinaceous, glycerine, tar, saccharine, "milling," and other special or fancy soaps, and soap powder. A mode is also described of mixing such matters with soap, made by the cold process and also by grinding or equivalent means without melting. The inventor further claims the admixture of such matters with all kinds of soap however made, when from fifty to one hundred, or from one hundred to three hundred per cent. and upwards of seaweed, or extract, or equivalent matters are employed. The invention also comprises certain modes of treating seaweed or similar matters for obtaining mucilage, pulp, or powder; also the use of vacuum pans or other apparatus for boiling or melting such soaps or fluids at a low temperature; also the use of stirring or agitating appliances driven by power in the manufacture or treatment of such soaps or fluids; also certain apparatus for ornamenting such soaps, consisting of appliances for interlacing, plugging, pouring, cutting, and figuring, which appliances are applicable to other soaps; certain terms as "seaweed soap" and equivalent appellations are employed for distinguishing those soaps from others.

A.D. 1875, January 13.—No. 130.

NORTH, Thomas, of Hitchin, in the county of Hertford, gentleman.—(*A communication from Owen Tomlinson, of Parel, Bombay.*)—"Improvements in axle boxes and appliances appertaining thereto."

This invention consists of further improvements in the new and improved axle box and appliances appertaining thereto, of which a Specification, dated 28th August, 1872, No. *, has already been filed.

The features of novelty of these improvements are:—Firstly. A centre tongue of iron, cast in the groove in which the washer is fitted in some axle boxes now in use.

Secondly. A slot or groove in the lower parts of the wooden washer (which in the present invention is made in two pieces fitting together with single lap joint).

Thirdly. A packing or stuffing box on each side of the brass bearing formed by a peculiar shape of casting for the top casting of the axle box.

The advantages of this invention are, that the centre tongue being higher than the inner and outer flange of the groove effectually prevents on the one hand rain drift from getting into the axle boxes and a consequent overflow of oil, and on the other hand prevents the oil in the axle box from escaping to the outside. It also effectually excludes dust and grit from the enterior of the axle box. (If thought desirable one or two small holes can be drilled through the bottom of the outer of the two grooves, which are formed by casting in the centre tongue, so as still further to provide for the escape of rain water). The packing or stuffing boxes moreover provide for a more complete, simple, and inexpensive system of lubrication than in any existing appliance of which I am aware.

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* The No. which is omitted from the Abridgment is, 3541.

A.D. 1875, January 13.—No. 131.

LEE, James, of Milwaukee, in the county of Milwaukee and state of Wisconsin, in the United States of America.—"Improvements in a breech loading magazine fire arm."

My invention relates to improvements in breech loading magazine fire arms, and consists:—

In constructing and arranging the breech mechanism in such a manner that but one screw is used for holding together and fastening said mechanism to the stock of the gun. Also in the peculiar construction and arrangement of the hammer, breech block, trigger, and tumbler, by means of which, when the gun is fired, the breech may be depressed into the frame or receiver by pushing or pressing the thumb piece of the hammer forward, thus bringing the breech block below the bore of the barrel for the extraction of the cartridge shell; also by arranging the mechanism in such a manner that the nose of the hammer is caused to drop below the face of the firing pin, allowing said firing pin to move backwards out of the way of the cartridge shell or the primer of the cartridge when a new one is inserted, thereby preventing all premature explosions. And in the peculiar construction and arrangement of the extractor and main spring, by means of which, when the breech block is depressed by the forward movement of the hammer, the spring acting on an arm of the extractor causes the latter at once to start the shell of the cartridge; and so soon as the breech block has reached a position below the bore of the barrel, the backward movement of the extractor ejects the shell from the gun.

The main spring being of the same width as the breech block and the ends thereof resting in a recess on the underside of the breech block and in a notch on the upper arm of the tumbler, while the elbow or bent portion rests on the arm of the extractor; no screw or other fastening is necessary and the breech block will so soon as the shell is ejected from the gun and another cartridge is inserted, cause the breech block to assume its original position ready for firing.

In fire arms of this kind the extractor has heretofore been operated by the breech block, but in this case it is operated entirely by the main spring, which constitutes a peculiar feature in this invention, and the extractor is so arranged that it will hold the breech block below the bore of the gun for loading, and will release the breech block at once upon inserting a fresh cartridge, the head of which will carry the extractor forward and release the breech block.

Also in the peculiar construction of the firing pin, by means of which the pin cannot become fast in the breech block from rust or other sources, and by arranging it in such a manner relatively to the other parts of the mechanism, that it cannot fall out of the breech block when the latter is depressed, or strike the primer of the cartridge while the breech block returns to its normal position.

Also in the peculiar construction of the frame or receiver for the breech mechanism, so that the entire breech mechanism may be taken out of the gun from above, by simply removing a pin; and said mechanism may be taken to pieces and put together again, and inserted back into the frame or receiver without the use of any tool whatever. The frame or receiver is also provided with a ledge or projection forming an opening in the upper part of the breech in which the head of the cartridge rests, and which serves for the escape of the gases when firing or from a premature explosion, while effectually closing against such gases the chamber containing the breech mechanism.

This ledge or projecton also serves as an abutment for the breech block and prevents the latter from rising above its proper position. The form of the frame renders it extremely simple and cheap to make, and permits a full stock being used with the greatest facility, it requiring only a plain mortice or slot to be cut in it to receive the frame and breech mechanism.

Also in the construction of a cartridge box so arranged that the cartridge can be stored therein very compactly and held in a position more convenient for loading, by suspending the same over the chest of the marksman, having its mouth in close proximity to the breech of the gun when in action, and attaching the same to the waist belt when not in use. Also by arranging the cartridge box in such a manner that it may encircle the gun by slipping it thereon over the muzzle to the breech, the mouth or opening being directly in front of the breech block, and by arranging a spring having a follower in such a manner that the cartridges are delivered automatically to the mouth of the cartridge box as fast as removed. And by constructing the casing of the cartridge box in such a manner that a supplemental cartridge box may be attached thereto when the main cartridge box is empty.

Also in the arrangement of the supplemental cartridge box so as to be capable of attachment to the main cartridge box. And lastly, my invention relates to certain details of construction in the gun and cartridge box.

A.D. 1875, January 13.—No. 132.

JUCKER, Robert, of Rochdale, in the county of Lancaster, engineer.—" An improved construction " of machine for cleaning knives and forks."

The novelty of the invention consists in the arrangement within the interior of a casing of two travelling endless brushes, which act upon knives and forks presented to their action through suitable openings in the outer case.

The supports or journals for the blocks, around which the brushes are carried, are so arranged that they will allow the working surfaces of the brushes to act upon the blades of knives for the purpose of cleaning the same, until the bristles of such brushes are worn away.

A.D. 1875, January 13.—No. 133.

WRIGHT, Matthew, and POLLARD, James, both of Wibsey, in the county of York.—" Improvements in driving spindles by means of bands."

This invention relates to certain improvements whereby many bands are dispensed with in the driving of spindles in spinning, drawing, and other frames in cotton or worsted machinery; and consists of arranging one band to drive the whole lot of spindles, or any less number. This improvement is applicable to any machine having more than one spindle requiring driving by bands.

A.D. 1875, January 13.—No. 134.

STANILAND, John Thomas, of Bury St. Edmunds, in the county of Suffolk, commercial traveller.— " Improvements in brakes for perambulators."

I place over and near to the forward wheel a bracket piece with a segment shaped chamber or recess on its under side to receive a loose ball, or it may be a roller of india rubber or equivalent elastic material. This ball is attached to a cord which is led under the perambulator and up to the handle thereof, and can thus be operated by the attendant as required.

A.D. 1875, January 13.—No. 135.

SCOTT, Henry Young Darracott, of Ealing, in the county of Middlesex, Major General, C.B.—" Improvements in the purification of coal gas."

The objects of this invention are (1) the removal of the carbonic acid from the gas by means of magnesia; (2) the breaking up of the bisulphide of carbon; and (3) the abstraction of carbonate of ammonia from the gas liquor.

A.D. 1875, January 13.—No. 136.

SINIBALDI, George Raphaël Francis, of Lewisham High Road, New Cross, in the county of Kent, spirit merchant.—(*Partly a communication from Pierre Sinibaldi, of Paris, France.*)—" An improved " method of and apparatus for preventing the formation and explosion of gas in the storage, transport, " and delivery of gaseous or inflammable oil or spirit."

This invention relates to a novel method of and apparatus for preventing explosions of the gas generated from petroleum and other like gaseous and inflammable materials in the storage or transport, or measuring and delivering of the same. The said invention consists, first, in storing the oil or spirit in a vessel in such a manner that to be withdrawn therefrom it must be displaced by the introduction of another liquid of different specific gravity, so that there is never any empty space in the vessel above the gaseous liquid, and therefore no gas can be generated from the said liquid in the vessel. The said invention also consists in apparatus composed of a cistern or reservoir of iron or other suitable material in which the petroleum and other oil or spirit is stored, and from which the same is drawn off ready measured.

A.D. 1875, January 13.—No. 137.

LEWIS, George Hermann, of Clapton Park, in the county of Middlesex.—" A new and improved " method of producing a draught through cigars to facilitate the smoking thereof, and implement for " that purpose."

The feature of novelty of this invention consists in punching a hole transversely through the end of cigars by means of a small punch and die placed inside a case or plate so as to facilitate the smoking of the said cigars.

A.D. 1875, January 13.—No. 138.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Ramon Bañolas, of Madrid, in the Kingdom of Spain.*)—" Improvements in extinguishing fires, and in apparatus or means to be employed therefor."

This invention relates more particularly to that description of apparatus or means for extinguishing fires, for which Letters Patent were granted to John Henry Johnson, bearing date the 1st of December 1871 (No. 3259), and consists of an improved mode of constructing apparatus of that class, and of an improved composition of the chemical charges to be used therewith, and also of certain arrangements for facilitating the transport of the apparatus to the place where a fire has broken out.

A.D. 1875, January 14.—No. 139.

NUSSEY, George Henry, and LEACHMAN, William Bradshaw, both of Leeds, in the county of York. —" Improvements in punching, shearing, and rivetting machines, and in the means or apparatus " employed for conveying and imparting the required motion and pressure to the same, such means " or apparatus being applicable for other purposes."

The piston rod or steam cylinder forms ram for hydraulic cylinder above or below steam cylinder. The water in hydraulic cylinder acts on the ram in its interior by means of a plunger.

The pressure is given to tools fixed in ram by another cylinder of less diameter than ram cylinder, containing a plunger with space for fluid.

Applicable to shearing machines, to machines for rivetting ships' sides by means of brackets carrying the apparatus; also applicable to other machinery.

A.D. 1875, January 14.—No. 140.

CAVE, John O'Connell, of Weston-super-Mare, in the county of Somerset.—" Improved apparatus " for navigating the atmosphere."

The body of the apparatus rests upon two vertical shafts of different length and diameter, and which are respectively fitted at or about their upper extremities with a set of blades, fans, or wings, the same being caused to revolve one above the other. The two shafts revolve around a common centre. The motive power is communicated to the shafts by a suitable engine. A rudder is employed for steering, and the motion and speed of the apparatus are regulated by the greater or lesser angle of inclination of the shafts, a lever or other contrivance being employed for that purpose.

A.D. 1875, January 14.—No. 141.

CAVE, John O'Connell, of Weston-super-Mare, in the county of Somerset.—" Improvements in the " construction of apparatus capable of being employed as an automatic governor or steam regulator, " steam guage, safety valve, and high steam alarm, and also for regulating the flow or pressure of " air, gas, water, and other fluids."

The objects of this invention are effected by means of a piston which works through a cylindrical valve. The external end of the piston is loaded and adjusted to suit any desired pressure, the internal end of the same being attached to a sliding cover or door or disc. The variable pressure of the steam in the boiler regulates the pressure thereof on its way to the engine, and acts in a direct manner on the piston, the steam-way to the engine being thus opened or closed according to the varying pressure in the boiler. This invention is also applicable, as will be well understood by mechanists, to the other purposes mentioned in the title.

A.D. 1875, January 14.—No. 142.

ARMSTRONG, JOSEPH, of Rotheram, in the county of York.—" Improvements in self locking switches " for railways."

For this purpose the switches are so formed that it is impossible for them to be shifted whilst a train is passing over them.

A.D. 1875, January 14.—No. 143.

STOKES, EDWARD PERCY, of Barrow-in-Furness, in the county of Lancashire.—" Improvements in " boat lowering apparatus."

There is a roller on deck with rope passing round same to davits and thence to bow and stern of boat; there is also a sheave pulley by side of roller with cord round same for releasing and securing roller.

A self acting locking pin is attached to boat and davit ropes bow and stern, so that as soon as the boat touches the water she is free.

A.D. 1875, January 14.—No. 144.

MALLET, ROBERT, of Westminster Chambers, in the city of Westminster, civil engineer.—" Improvements in the production of plates or surfaces containing inscriptions, marks, or devices, and in the " machinery or apparatus employed therein."

My invention relates to an improved process for the economical production of plates or surfaces of brass, bronze, or other metals or alloys, or metals or alloys combined with phosphorus, containing inscriptions or numbers, or both, and presenting the character of such plates when produced by the engraver on metals.

According to the ordinary method of producing plates of this description, the numbers or letters are usually sunk or incised by hand below the surface of the plate, the cavities being afterwards filled up with black, red, or other wax, or like resinoid material, by which the inscription becomes apparent and legible.

Now my invention has for its object cheapening the production of such plates, and consequently extending the demand for them by the substitution of mechanical means for the skilled labor of the engraver.

For this purpose I propose to cast such inscribed plates with the sunken characters already sunk beneath the general surface of the plate, so that the sunken parts have simply to be subsequently filled up level with the wax or like material and the surface of the plate polished off as in the ordinary manner.

In carrying out my invention I employ a peculiar process for moulding and casting, combined with certain mechanical arrangements for readily and perfectly forming the mould for the cavities forming the letters or devices in or on the plates, together with certain other apparatus for rapidly changing the model, from which numerals or marks are to be moulded.

A.D. 1875, January 14.—No. 145.

NELSON, WILLIAM, of Birmingham, in the county of Warwick, stamper and piercer.—" An improved " spring scarf, clip, or adjuster."

The novelty of my invention consists in making scarf spring clips from two pieces of metal by the use of latteral arms, the said latteral arms forming a part with the body of the clip.

A.D. 1875, January 14.—No. 146.

MORGAN-BROWN, WILLIAM, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communicatiom from George Crompton, of Worcester, Massachusetts, United States of America, engineer.*)—" Improvements in " looms for weaving."

These improvements consist in multiplying the harness frames by arranging them in tiers; and in the adaptation of the mechanical parts to impart the requisite motion.

A.D. 1875, January 14.—No. 147.

HARGREAVES, James, of Widnes, in the county of Lancaster, chemist.—" Improvements in the " manufacture of sulphates, and in apparatus employed therefor."

This relates to the well known direct action process for the manufacture of sulphates of soda and potassa; and consists :—

First. In making each joint of the sulphurous acid flues pass through a box or well containing fine sand or like material.

Second. In forming the pyrites burner doors of a fire brick tile or non conducting material contained in a frame.

Third. In placing the converting chambers in series back to back, and passing the sulphurous acid flue between them.

Fourth. In superheating steam before admixture with the sulphurous acid by passing such steam through a chamber of finished sulphate, and in drawing air from a chamber of finished sulphate through a newly charged chamber.

Fifth. In using vessels of water to cool, when too hot, the gases issuing from the exhauster, and heat such gases when too cold.

Sixth. In forming the enclosing walls of pyrites burners double, and passing steam through the space thus formed, such steam is afterwards mixed with the sulphurous acid; in making openings from the said space into the pyrites burners, and in passing steam through the pyrites burners.

Seventh. In using an archimedean screw, continuous scrapers, or travelling aprons to withdraw finished chloride from the chambers.

Eighth. In passing the evolved gases through cooling syphons placed between the exhaust and the condensing tower.

Ninth. In consolidating and breaking salt by passing such salt on an endless band between rollers through a heating chamber, and finally through breaking rollers.

A.D. 1875, January 14.—No. 148.

LUPTON, Arnold, of Bagillt, in the county of Flint, North Wales.—" Improvements in self lubri" cating wheels and axles for corves or trams used in coal and other mines, applicable to other " surfaces requiring lubrication."

This invention mainly consists in a wheel made of suitable metal constructed hollow, so as to hold a quantity of the lubricant, which is introduced by means of an aperture in the side or any other convenient part of the wheel, such aperture being closed by suitable plug or valve. The oil from the hollow of the wheel reaches the axle by suitable hole bored through the boss, in which hole a piece of wire or other suitable "needle" is placed, which as the wheel revolves moves up and down, and so keeps the hole from being clogged and allows the oil to reach the axle.

The invention is applicable to wheels fast on the axle or loose on the same, which is described in the Provisional Specification.

A.D. 1875, January 14.—No. 149.

HUMBLE, William, of North Shields, in the county of Northumberland.—" A new or improved con" struction of life boat."

The novelty of the invention consists in constructing a life boat from keel to gunwale with longitudinal tubes or cylinders composed of canvas, cork, and marine glue, the whole of which are transversely connected internally with wooden frame work.

A.D. 1875, January 14.—No. 150.

RYDILL, George, of 8, Quality Court, Chancery Lane, in the county of Middlesex.—" Improvements " in machinery and apparatus in the construction and working of vessels, tanks, reservoirs, and areas, " and materials used for the purification of sewage and other polluted waters."

This invention of improvements is for the treatment of sewage and dye waters as well as treating, purifying, and preventing the pollution of rivers and streams, so that the same may be used for domestic and manufacturing purposes by improved construction of vessels, tanks, reservoirs, areas; means and materials used to effect the same: and in improvements in machinery and apparatus for supplying waterclosets with water; and in materials and method of purifying the same, which are also adapted for other purposes.

A.D. 1875, January 14—No. 151.

ABSALOM, William and GRIFFITHS, Edward, both of Liverpool, in the county of Lancaster.—"Improvements in the method of and apparatus for steering steam ships."

In carrying our invention into effect, we fit a chain-wheel or pulley on (in the case of a screw steamer) the screw shaft. Round this wheel we pass an endless chain, rope, or band, which passes up to the deck or position required for steering. This endless chain is arranged to drive two loose pulleys in reverse directions namely to port and starboard. These pulleys transmit motion by means of endless chains, ropes, or bands, to two loose pulleys fitted on the shaft of an ordinary steering apparatus. Between these pulleys there works a friction clamp, or a clutch, working on a feather on the steering shaft, so that the said clamp, or clutch, will communicate rotary motion from the pulleys to the steering shaft, either to port or starboard, according to the direction of the pulley it is in gear with.

A.D. 1875, January 14.—No. 152.

PERRY, Robinson Gale, of the city and county of Dublin, in the Kingdom of Ireland.—"Improvements in drying peat and other substances, and in apparatus for accomplishing the same."

The materials in cages running on a tramway enter a long tunnel through a door kept closed except when admitting said cages. Above this end is the chimney shaft. They traverse the tunnel to the other end, where the furnace is placed and where abundance of air is admitted. From thence if necessary the materials are carried to an extra dessicating chamber. The details differ materially according to the substance to be treated.

A.D. 1875, January 14.—No. 153.

NEWTON, Henry Edward, of the Office for Patents, 46, Chancery Lane, in the county of Middlesex, civil engineer.—(*A communication from Alfred Nobel, of Paris, in the Republic of France.*)—"Improvements applicable to burners for lighting purposes."

In carrying out the invention the illuminating flame is made to heat a volume of air supplied under pressure to a tube or tubular vessel, from which it issues from a suitable jet, and is made to impinge on the flame. By this means the intensity of the light is greatly increased, and the atoms of carbon are more effectually consumed.

A.D. 1875, January 14.—No. 154.

TURNER, Archibald, of Leicester, in the county of Leicester, elastic web manufacturer.—"Improvements in the manufacture of elastic fabrics."

In carrying out my invention, I take a loom just as it is prepared with six shafts for weaving elastic terry fabrics in the ordinary manner, and I add thereto another shaft for the purpose of introducing warp locking threads. These threads are so woven as to "mock" the rubber strands, that is to say, when the rubber strands are up, the warp locking threads are down, and when the latter are up, the rubber threads are down. These locking threads during the succeeding two shoots act as gut threads and rise and fall with the rubber.

This way of weaving, locks the rubber strands and prevents them from running up should any become broken.

A.D. 1875, January 14.—No. 155.

CHATWOOD, Samuel, of the Lancashire Safe and Lock Works, Bolton, in the county of Lancaster.—"Improvements in fitting ships and other floating structures to protect them against fire."

According to this Provisional Specification, advantage is taken of the ship's displacement to provide a sufficient head of water for a system of hydrants. The hydrants in the accessible portions of the ship are provided with hose and jets, and in inaccessible parts are provided with fusible plugs which melt on the application of undue heat.

The Specification also describes making the decks hollow, or placing one or more pipes beneath them and filling the cavity with a substance capable of evolving gas or moisture on the application of heat, or the space may be filled with water and the under surfaces of the decks or pipes provided with fusible plugs.

In steam ships a steam pipe may be passed through the compartments of the ship and be provided with fusible plugs.

The Specification also describes arranging a shaft or shafts in a line with the reef (which may be from end to end of the vessel) for working pumps either by hand or steam power.

A.D. 1875, January 14.—No. 156.

JOHNSON, Samuel Henry, F.C.S., of Lea Bank Works, Stratford, in the county of Essex, chemist.—" Improvements in cocks or valves."

This Complete Specification describes constructing a draw-off cock or valve of a shell or casing with a side projection to be screwed or fixed to the pipe or passage from which fluid under pressure may have to be drawn off. Through opposite ends of the shell or casing is passed a tube, and where the tube passes out through the ends, tight joints are obtained by cup leathers or other packing. The tube can be moved endwise through the packings, and in it are ports or openings of such a form as not to cut the packing. When the tube is moved endwise so as to bring the ports within the chamber formed by the shell or casing, fluid passes through them and escapes at one end of the tube.

A.D. 1875, January 14.—No. 157.

WILLANS, Jacob Geoghegan, of No. 9, Saint Stephen's Crescent, Bayswater, in the county of Middlesex.—" Improvements in furnaces."

The inventor describes a blast or cupola furnace in two parts, the upper part into which the material is charged being suspended over the hearth and tuyeres contained in the lower part, the intervening space being packed round with any suitable substance to cause the blast to ascend through the upper part and to admit of removal and replacement without cooling down the furnace. He has the lower part in duplicate and on trucks to allow of either being placed under the upper part.

A.D. 1875, January 15.—No. 158.

GARTSIDE, John Henry, and **BRADBURY, Charles Timothy**, of Buckton Vale, in the county of Chester.—" Improvements in machinery or apparatus for finishing woven fabrics."

This invention relates to the fallers in what is commonly called a beetle machine, wherein the fallers are used in connection with a cylinder or roller, upon which the cloth or fabric to be finished is being wound, and consists in various improved arrangements and combinations of wrought iron or bessemer steel, wood, and anti concussion materials, in order to prevent the excessive wear and tear of the fallers, and enable them to resist the usual breaking action caused by the incessant concussion when in use.

A.D. 1875, January 15.—No. 159.

POPE, Robert Philip, of No. 8, King's Road, Gray's Inn, in the county of Middlesex, architect and surveyor.—" Improvements in the formation of walls, partitions, floors, and roofing of buildings and " other structures."

The invention relates first to forming walls of loam and such like matters with a coating of cement or such like material or hollow with moulded facings.

And secondly to forming floors, slabs, partitions, steps, stairs, and other surfaces by the use of hop bines or other woody fibre, asphalt, tar, or other such like bituminous substance, cement, or such like plastic substance, and also of glue, venice turpentine, linseed oil, varnish, litharge, or other oxide of lead, carbonate of potash, rock alum, pitch, resin, sulphur, in various proportions.

A.D. 1875, January 15.—No. 160.

GAY, Paulin Etienne, of Boulevard de Strasbourg, No. 23, at Paris, engineer.—" An improved " rotatory machinery for excavating and cutting rock and other material."

This invention relates to rock cutting apparatus consisting of a pair of rapidly rotating discs mounted at the end of a narrow jib, which can be worked upwards or downwards on trunnions on a moveable framing. The discs are either edged with soft metal and supplied with water or oil and sand, emery or other grinding material, or it may be with acids or other chemical reagents, or they are provided with chisel or cutters, diamonds, or other gems. As the discs are made to rotate while the jib on which they are mounted is swayed upwards or downwards, they cut two chases into the rock, leaving between them a thin slice of rock which can be broken away. The grinding material is conveyed from the framing to the discs by a travelling band or creeper, or may be projected as a jet upon them.

A.D. 1875, January 15.—No. 161.

ROGERS, Henry, of the firm of Henry Rogers, Sons, and Company, of Wolverhampton, in the county of Stafford, merchants.—(*A communication from Henry Mullholland, of Montreal, Canada.*)—"Improvements in chisel pointed cut nails, and in machines for the manufacture of the same."

According to this invention the chisel pointed cut nails are formed with a head by compressing or upsetting the metal at the head part of the nail, the parts of the machines for manufacturing the chisel pointed and headed cut nail mainly resembling those of ordinary cut nail machines; but the said machines are provided with dies suitable for cutting the chisel point and the necessary adjuncts for working and supporting the said dies.

A.D. 1875, January 15.—No. 162.

MARSHALL, James, of Gainsborough, in the county of Lincoln.—"Improvements in thrashing machines."

These improvements relate to various appliances for protecting the drums of thrashing machines when fed by manual labor, and also apparatus for feeding such machines by mechanical means.

A.D. 1875, January 15.—No. 163.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co. patent agents, Southampton Buildings, London.—(*A communication from Amos Whittemore, of Cambridgeport, Massachusetts, United States of America.*)—"Improvements in machinery for manufacturing spikes."

This invention has relation to machinery which is designed for making split spikes for holding down railway rails and for other like purposes, the said machinery being especially designed for making spikes which have a small prong that will spread out during the act of driving the spike into a cross tie.

A.D. 1875, January 15.—No. 164.

GILMOUR, Thomas, of Kilcattan Tile Works, in the county of Bute, North Britain.—"Improvements in safety valves."

The improvements are effected by means of what may be termed automatic easing apparatus consisting of a small additional valve loaded to the pressure at which the main valve or valves are to open, and having over it a cover fitted to work freely on the spindle of the small valve and on the outside of the valve seat. This cover is connected to the lever of the main valve or to a lever by which the main valve or valves can be eased.

A.D. 1875, January 15.—No. 165.

COWPER, Charles Neaves, of Number Three, Bruntsfield Crescent, Edinburgh.—"An improved economic method of heating towns and villages or sections thereof."

The features of novelty which constitute the invention are, 1. The application of known methods of heating by means of steam and hot water piping to the larger area of towns or villages and the houses and premises therein, the heat being supplied from one common source. This system or process will secure the following novel economical results and advantages, (1) great economy of fuel and utilization of heat; (2) the continuous equalization of the temperature of rooms; and (3) it can be utilized where the system is in force for rapidly clearing the streets of snow.

A.D. 1875, January 15.—No. 166.

REID, William, of the city of Glasgow, in the county of Lanark, North Britain, shirt manufacturer.—"Improvements in and connected with sewing machines."

This invention consists in the winding of the thread to be used for sewing machines, in the form of a hollow cop cylindrical throughout, upon a small portable spindle, fitted and driven by a square end or fixed head or disc, in the ordinary winding apparatus of the sewing machine, or other suitable winding mechanism; the spindle having a loose collar for forming and removing the hollow cop from the spindle. The cop so formed is placed stationary and tight by its own elasticity within the shuttle, and the thread may be wound off either from the inside or outside of the cop and led through a hole in the front end and vertical side of the shuttle, thence along the enclosing lid under a light tension spring, round a pin at its back end, and laterally through the usual tension holes in the upper side of the shuttle. By the use of these cops the spools or bobbins hitherto employed are dispensed with in the shuttles of sewing machines.

A.D. 1875, January 15.—No. 167.

JENSEN, Peter, of 89, Chancery Lane, in the county of Middlesex.—(*A communication from Wilhelm Klinkerfues, Doctor and Professor, and superintendent of the Royal Observatory at Gottingen, Germany.*)—" Improvements in the construction of hygrometers."

A gallows from which in two hairs is suspended a staff with a scale at one end, from the staff two other hairs go down to two points on the bedplate on the gallows, the top points and the bottom points are respectively adjustable in their distances apart, the four points of attachment on the staff are placed so relatively to the top and bottom points that the staff by the expansion of the hairs obtains a twist. The apparatus is covered by a bell.

A.D. 1875, January 15.—No. 168.

BENNETT, Francis Graham, of 28, Grand Parade, Brighton, in the county of Sussex.—" Improvements in roller skates."

According to this Provisional Specification the axis of each pair of rollers is carried by arms descending from a plate which rests against and at its centre is pivoted to the bottom surface of a metal block fixed to the underside of the skate. The underside of the metal blocks fixed respectively below the heel and toe ends of the skate are each set at an angle in such manner that a line at right angles to such surface inclines backwards, whilst a similar line at right angles to the surface of the back block inclines forwards the back edge of the plate which carries the rollers is caused to bear against a strip of vulcanized india rubber clamped to the underside of the skate.

A.D. 1875, January 15.—No. 169.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Ferdinand Charles Honoré Philippe d'Esterno, of Paris, France.*)—" An improved kite or ærial apparatus for military and other purposes."

The apparatus consists of a sail or cloth to be raised by the wind and retained by cords in an extended position, it being made of sufficient area to support a look-out man at the desired height in the air, or it may be used for signalling, or for purposes of amusement, exercise, or exhibition.

A.D. 1875, January 15.—No. 170.

SCOTT, James Cuthbert, of Manchester, in the county of Lancaster, engineer.—" Improvements in machinery for moulding toothed wheels and other circular articles."

This invention refers to an arrangement wherein a trammel is employed for carrying a segmental portion of the pattern for toothed wheels or other circular articles.

A.D. 1875, January 16.—No. 171.

ALSTON, William, of Preston, in the county of Lancaster, builder and cabinet maker.—" Improvements in adjustable chairs and other seats."

The seat or portion on which the occupant sits is at its rear end pivoted, hinged, or jointed to the rearward portion of the frame of the chair or seat in such-wise as to permit of the raising or lowering at will of the forward part of the seat, which is arranged to operate in conjunction with supports of different lengths projecting from a shaft or spindle carried by the framing of the chair.

By another arrangement the chair seat is made capable of being slided to and fro from the front to the back of the chair, in such a manner that the length of the seat from the back to the front of the chair may be readily accomodated to the convenience of the occupant.

An adjustable back used in conjunction with the above described adjustable seats is made so as to extend from about the bottom of the shoulder blades of the user to within about four inches (more or less) of the seat of the chair. This adjustable back is made to swivel in the rearward portion of the chair, and has combined with it a quadrant and set screw or equivalent means for holding it in any required position.

The arrangement of adjustable parts above described is applicable to various forms of garden or other seats.

The backs of the improved chairs may be so constructed as to readily admit of the attachment thereto of a head rest, which is constructed by preference of steel wire so formed as to make the natural elasticity of the steel of which it is composed available as a spring, and so arranged as to be easily removable. The two ends of the steel wire of which the head-rest is formed, point downwards and enter suitable holes in the upper framework of the chair back. That portion of the head rest against which the head of the occupant presses is suitably upholstered. This construction of head rest is also applicable to other chair backs.

A.D. 1875, January 16.—No. 172.

JOLLEY, William, of Heaton Norris, in the county of Lancaster.—" Improvements in railway " signals and in the method of working the same, partly applicable to signalling in foggy weather."

The features of novelty in this invention consist in the use and application of the pneumatic principle to the purpose of simultaneously actuating two semaphore or other signals situated at a distance from each other for working upon the block system, and whereby the usual cranks and connecting rods are dispensed with; and also in adapting the same principle for signalling audibly in foggy weather or for working single signals from a distance, say, for instance, from the usual signal box.

A.D. 1875, January 16.—No. 173.

GANDY, Maurice, of Liverpool, in the county of Lancaster.—" Improvements in the construction " of wheels for railway rolling stock."

The features of novelty of this invention consist, firstly, in forming a bulb or dovetailed ridge on the inner periphery of the tyre, and casting onto this ridge the body and nave of the wheel. Secondly, in forming the body and nave of the wheel in two discs, constructed at their outer edges to take onto and grip a bulb or dovetailed ridge formed on the inside periphery of the tyre. The discs are provided with projections, male and female, to take the strain; and are held together by bolts. The discs may be shrunk onto the tyre or fitted thereto.

A.D. 1875, January 16.—No. 174.

BAYLISS, Moses, of the firm of Bayliss, Jones, and Bayliss, and **JONES, Edwin**, both of Wolverhampton, in the county of Stafford.—" Improvements in nuts and washers for screw bolts."

A circular ratchet is formed in any convenient position on the nut and concentric with the centre of the hole through the nut. The teeth set in an opposite direction to that in which the nut is screwed up. The washer is square or straight on one side, to come against a straight parallel projection, or of any suitable shape to prevent it from turning round, or is made with two or more bolt holes and used for two or more bolts. A round washer may be used for positions where the friction of the tightened washer will prevent it turning round; and washers for bearing against wood may have parts thereof turned into the wood. One, two, or more pieces or teeth are pressed up out of the washer to catch in the ratchet teeth on the nut and prevent it unscrewing. The teeth on the washer act as springs, and spring into gear with the ratchet teeth on the nut when the latter pass off the former. Instead of forming ratchet teeth on the washer, parts purposely formed on the washer may be turned into the teeth on the nut when the latter are in accessible positions for doing so. By this invention nuts are prevented from being unscrewed and shaken off or from working loose by any jarring action to which they may be exposed.

A.D. 1875, January 16.—No. 175.

VERA, Pedro, of the United States of Colombia, in South America, at present residing at Number 45, Kensington Garden Square, Bayswater, in the county of Middlesex.—" Improvements in gas or hot air " engines, heated by heat generated by chemical action igniting hydrogen and oxygen gases to form " water."

My invention consists of a process and apparatus for generating heat and motion, by causing the explosion of a mixture of hydrogen and oxygen gases in the proportions for forming water, and utilizing the heat generated, thereby to convert the water so formed into steam, also to heat air to a high temperature with the steam produced in order to serve as a motor like steam serves, and also utilizing the electricity generated by the oxygenation of the hydrogen for decomposing water to obtain hydrogen and oxygen gases to add to the supply of gases for the same machine.

A.D. 1875, January 16.—No. 176.

LONGSDON, David, of Number 4, Queen Street Place, in the city of London, gentleman, and **TOPPIN, Percy**, of Number 9, Cloak Lane, in the city of London aforesaid, wine merchant.—"Certain improvements in the construction of shoes for horses and other animals."

Constructing the shoes of horses and other draught animals with grooves having curved or tapering sides or with projections, into which grooves suitably shaped studs are secured by means of screws having a shoulder or head. The studs have holes made nearly through their thickness of one diameter or size and of lesser proportions through the remaining substance. In another method the shoe has slots cut in it to receive the tongues of studs, which are held in place by screws passed through from the side of shoe; one or more clips are attached either to the studs or to the shoe and the studs are in some cases "tempered," case hardened, "or chilled."

A.D. 1875, January 16.—No. 177.

MARSDEN, Benjamin, of Manchester, in the county of Lancaster, screw bolt manufacturer.—"Improvements in machinery for making untapped nuts for screw bolts."

This invention relates to improvements upon the Patent granted to Philippe Kock, dated 13th December 1869, No. 3593.

A.D. 1875, January 16.—No. 178.

VON FABER, Johann Lothar, of Stein, near Nuremberg, in the Kingdom of Bavaria.—"Improvements in writing and drawing pencils."

This Provisional Specification describes producing a pencil for writing or drawing purposes, the writing of which can be copied equally as well as the writing produced by copying ink.

The pencils are produced from aniline, graphite, and kaolin, by a cold process.

A.D. 1875, January 16.—No. 179.

GLEDHILL, George, and **GLEDHILL, William**, both of Slaithwaite, in the county of York, rug makers.—"An improved signalling apparatus to be used on railways."

This relates to self-acting signals whereby, when one train is between two given points, the conductor of a second train is made aware of the fact by means of the signal raised by the former train in passing the first point, which signal remains raised until the preceeding train has passed the second point.

A.D. 1875, January 16.—No. 180.

THOMPSON, Edmund, of Sutton, Surrey, ship broker.—"Improvements in rafts for passenger ships, and in the means of launching rafts and ships' boats."

This invention consists in a rectangular frame of wood, built of longitudinal and transverse pieces so as to divide it into rectangular parts; each part is fitted with cork mattrasses, and lockers are provided for provisions, water, and instruments. The raft lies athwart ships, and when the end support is removed the raft takes an inclined position and is launched on its supporting rollers into, the sea. The raft also carries a boat resting on rollers, also launched in the same way when the raft is placed in the incline position.

A.D. 1875, January 16.—No. 181.

BOX, John, of 20, Great George Street, Westminster, civil engineer, **AUBERTIN, Edouard**, of No. 66, in the Boulevard of Strasburg, in the city of Paris, gentleman, **BOBLIQUE, Leopold**, of No. 72, in the same Boulevard, chemist, and **LEPLAY, Hypolite**, of Ruelle des Meuniers, No. 4, et Bercy, in the city of Paris, chemist.—"Improvements in the manufacture of phosphate of iron, and its application to the preparation of alcaline phosphorus, and to the extraction of phosphorus."

Phosphate of lime is dissolved in hydrocloric or other acid, and oxide of iron is also dissolved in similar acid, the two solutions thus prepared are mixed, the insoluable matter from each are removed, and the excess of acid saturated with carbonate of lime, a precipitate of phosphate of iron is formed which is employed in the manufacture of ammonical salts; also the preparation of alcaline phosphates by a wet and dry process as described.

A.D. 1875, January 16.—No. 182.

HEWITT, James Booth, of West Ham, in the county of Essex.—"An improved 'poleaxe' or instru-"ment for slaughtering animals."

The instrument consists of a lever arm carrying a punch at one end and operated by powerful springs, the lever being retained by a trigger or catch when drawn back or cocked for use.

The instrument is mounted on a plate which is securely attached by straps to the front of the animal's head.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 10 to July 16, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, January 18.—No. 183.

HOPE-VERE, CHARLES EDWARD, of No. 4, Norfolk Street, Park Lane, in the county of Middlesex, gentleman.—"Improvements in apparatus for use in the cleansing of china, glass, and earthenware "articles of domestic use."

For the purpose of this invention a chamber or closet is employed capable of being closed by doors or shutters, and this chamber is either formed of or is lined with metal or waterproof material. Within this chamber or closet are provided racks and partitions of different dimensions; the bars forming the vertical and transverse supports, and partitions being formed of hollow metal perforated in various directions, so that fluid conducted thereto under pressure may impinge upon and act upon every part of each surface of plates, dishes, and such like articles placed in these racks.

Other parts are formed to receive and operate upon cups, saucers, wine and other glasses, decanters, and other bottles. To more effectually cleanse the interiors of decanters and other bottles, part of the closet is formed with a vertical tube perforated at its upper and other parts, so as thereby thoroughly to cleanse the whole interior surfaces, whilst other jets act on the exterior.

If desired these interior parts of the chamber or closet may be divided into several sets, so that any one may be used alone by employing a tap or valve from a main to each separate set of jets.

The cleansing liquid may be hot or cold water saturated with saponaceous or other matter to assist the cleansing.

A.D. 1875, January 18.—No. 184.

WALLER, GEORGE, of the Phœnix Engineering Works, Holland Street, Southwark, in the county of Surrey, and of the Phœnix Iron Works, Stroud, in the county of Gloucester.—"Improvements in "apparatus used in the manufacture of gas."

This invention has for its object the construction of retort lids and mouthpieces, whereby they may be sealed, or the joint between them rendered gas-tight without the aid of ordinary luting; and consists in casting upon the mouthpiece near its front end a flange with a dovetailed or other groove therein. The face or front end of the mouthpiece is cast so as to form a curved and throated flange, which partially covers the flange first mentioned. The dovetailed groove is filled with a ring cast in soft malleable metal. A lug or lugs are cast on each side of the mouthpiece; and to this lug or lugs is hinged the lid or door, corresponding lugs being also cast upon it. The door is cast with a turned up and V shaped edge. To the lugs before mentioned is hinged also a cross bar, which is received into a staple hinged to the mouthpiece on the opposite side to which the door is hinged, and furnished with a small screw and cross handle. When the door is closed the V-shaped edge of the lid is brought into contact with the soft metal ring, and upon the staple being brought over the end of the cross bar and the screw turned, such a pressure is brought to bear upon the lid as will cause its edge to bed itself in the soft metal and thus form a gas-tight joint.

A modification of the foregoing consists in casting a projection upon the flange of the mouthpiece and a recess for the reception of soft metal in the edge of the lid, the effect when the lid is closed being similar.

A second modification consists in casting a projection upon the flange of the mouthpiece, which projection together with the surface edge of the lid is turned with a flat face.

Instead of the staple having a screw, as before described, it may have inserted in the slot a roller, which is brought to bear upon the curved end of the cross bar by means of a short handle attached to the staple or slotted piece.

A.D. 1875, January 18.—No. 185.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Robert Bustin, of Saint John, New Brunswick, Canada, gentleman.*)—" An improved machine for hanging wall paper."

The first part of this invention relates to a combination of four rollers so arranged in a box that the wall paper may before being used, by passing over the central roller, be covered with paste of an even thickness. The second part of the said invention relates to a thin metal plate parallel with the rollers and so arranged as to regulate the thickness of the paste and to spread it uniformly on the paper and keep it from lumps.

A.D. 1875, January 18.—No. 186.

SCOTT, William Middleditch, of the firm of W. and C. Scott and Son, of Birmingham, in the county of Warwick, gun manufacturers.—" Improvements in breech loading small arms."

This invention consists in fixing down the barrels of drop down guns and holding the said barrels tightly against the face of the break off by means of a projection on the upper side of each of the barrels taking into recesses, when the barrels are shut down, in the break off, sliding bolts working in the break off being shot into holes in the said projections. These bolts are worked by a lever on the tang of the break off, or on the side or underside of the gun. The mechanism described is used in conjunction with a steel lump on the underside of the barrels, and a sliding bolt taking into the said steel lump.

A.D. 1875, January 20.—No. 212.

IMRAY, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from François Aimé Tournier, of Longchaumois, Jura, France.*)—" An improved instrument or apparatus for bruising, masticating, or disintegrating food."

This invention relates to an instrument or apparatus for use at meals by persons deficient of teeth. The instrument has arms like nutcrackers with projecting ribs and hollows alternating in the jaws thereof, so that by working the arms to and from each other, morsels of food placed between the jaws are bruised, masticated, or disintegrated before being placed in the mouth.

A.D. 1875, January 20.—No. 214.

BOX, John, of 20, Great George Street, Westminster, civil engineer, AUBERTIN, Edouard, of No. 66, in the Boulevard of Strasburg, in the city of Paris, gentleman, BOBLIQUE, Leopold, of No. 72, in the same Boulevard, chemist, and LEPLAY, Hypolite, of Ruelle des Meuniers, No. 4, et Bercy, in the city of Paris, chemist.—" Improvements in the disinfection of solid and liquid matters such as night soil sewerage, either together or separately, gas, and other foul waters."

We employ a soluble alkaline phosphate and a soluble salt of magnesia and oxide or other form of iron. We employ these agents in different combinations. We prefer phosphate of potash or ferruginous soda prepared by calcination in a reverbatory furnace, the phosphate of iron with the sulphate of soda and a soluble salt of magnesia such as the chloruse of magnesium. The liquid to be disinfected is allowed to run through the raw products as they leave the reverbatory furnace; the sulphuretted hydrogen is deposited in the state of sulphate of iron. To the liquid thus deprived of the sulphuretted hydrogen soluble salt of magnesia is added; magnesium phosphate of ammonia is formed and precipitates itself with the azoted organic matters. To disinfect solid matters the same products are used dry in powder. We also employ phosphate of lime dissolved in hydrochloric acid, and oxide of iron also dissolved in chlorhydric acid.

A.D. 1875, January 20.—No. 216.

NARDI, Francesco Dominique, engineer, of 13, Rue Gaillon, Paris.—" Improvements in machines for blocking the uppers of boots and shoes."

This invention consists in the use of a plate of metal, the lower edge of which is cut to the shape of the upper or front part of the shoe, the upper face being cut to correspond with the back part of the shoe; it has a to-and-fro motion between cheeks and the upper being drawn through it by appropriate mechanism it assumes the exact shape cut out on the plate.

A.D. 1875, January 23.—No. 263.

MANNING, Richard Hellyer, of 3, Saint George's Road, Marylebone, in the county of Middlesex.—"An improved plane iron."

This invention relates to what are known as plane irons, wherein the improvement on the present system is derived by the screwing together of plates of iron or steel with a very thin plate of steel placed between the outer plates.

In carrying out my invention the bed iron is constructed with a hole or long slot in or about the centre of it, so as to allow sufficient room for a screw to pass freely through the head of the screw to bed on the underneath side of the bed iron.

A.D. 1875, January 23.—No. 272.

POTTS, Joseph Charles, of Handsworth, in the county of Stafford, manufacturer, and **DARNELL, Daniel Charles West**, of Cargilfield, Trinity, Edinburgh, Clerk in Holy Orders.—"Improvements in "apparatus for ventilating water closets, lavatories, bath rooms, sinks, and other structures and "appliances connected with sewers."

The object of this invention is to ventilate water-closets and other structures in such a manner that sewer gas is excluded therefrom, and the sewer gas delivered into the atmosphere at a point where it cannot gain access to the building, and any exhaustion or diminution of pressure in the closet soil pipe or other pipe communicating with the external drain made to result in a current of fresh air from the atmosphere passing into the building.

The soil pipe of the water-closet, sink, or bath opens into a funnel shaped chamber, the top of which is open and is on or above the level of the ground. The bottom of this chamber terminates in an ordinary water trap. Near the part of the soil pipe fixed into the sewer is a vertical pipe or air shaft rising to the top of the building. Should the equilibrium of the air within and without the building be destroyed from any cause so as to induce a current into the house, the equilibrium is restored not by gas from the sewer, but by a current of atmospheric air passing through a grating at the top of the air chamber into which the soil pipe opens. If from pressure of wind or otherwise there is a tendency to a gaseous current from the sewer towards the house, the gas driven from the sewer escapes by the vertical pipe or air shaft, and is delivered into the atmosphere.

A.D. 1875, February 6.—No. 451.

BOUCLEY, Paul, of the firm of P. Boucley and Co. of Nonancourt (Eure), France, manufacturers.—"Improvements in manufacturing straps, bands, harness, ropes, pipes or other articles."

This invention relates to the manufacture of straps, flexible pipes, and other articles usually made of caoutchouc, gutta percha, or of tissue served with agglutinating or waterproofing material. Instead of tissue, wherein the weft threads take no part of the longitudinal strain, only warp threads are used passed through a reed so as to be laid uniformly side by side, and served with agglutinating material, which is a syrupy solution of caoutchouc, gutta percha, or boiled oil mingled with vulcanising agents and colour when required. For straps a number of such warps are laid together with a piece between having cross fibres to resist the pull of rivets and the like. For pipes a number of such warps are wound over each other helically on a mandril, crossing the successive turns. The whole is coated with caoutchouc or india rubber fabric, and vulcanised.

A.D. 1875, February 10.—No. 492.

JONES, Harry Langston, of Webster's Hotel, Ely Place, Holborn, in the county of Middlesex, civil engineer.—"Improvements in solid and liquid disinfectants aud deodorizers."

This invention relates to disinfecting powders and solutions, and consists in a combination or mixture of mineral sulphates and chlorides of the earthy salts, especially the combination of sulphate of zinc with chloride of sodium or of calcium.

The salts are powdered and mixed in the proportions of 10 per cent. of sulphate of zinc to 90 per cent. of chloride of calcium.

For liquid disinfectants this same powder is dissolved in water in the proportions of 1 pound of the powder to each gallon of water, and it is coloured by the addition of a small quantity of aniline blue.

A.D. 1875, July 10.—No. 2486.

BOUSFIELD, GEORGE TOMLINSON, of Sutton, in the county of Surrey.—(*A communication from Reinhold Kohrig and Robert Pzillas, both of Brieg, Prussia.*)—"Improvements in apparatus for the "manufacture of sugar in lumps or bars."

This complete Specification describes a press similar to a brick making machine.

A.D. 1875, July 12.—No. 2497.

MACKINNON, DUNCAN, of the town of Stratford, in the Province of Ontario, Canada, druggist.—"Improvements in writing instruments."

My invention consists, first, of a tapering writing point of glass, metal, or other suitable material, placed at the foot of and in combination with a reservoir of ink; the said writing point being held in a detached holder and centrally perforated with a fine bore or hole, through which the ink is led down from the reservoir to the paper in a thin thread-like stream.

My invention consists, secondly, of an automatically acting valve (seated on the top of the writing point proper, closing the ink bore or duct), and a spindle, attached to the said valve, passing downward through the bore of the writing point. The duty of the valve being to shut off the flow of ink when the operator ceases writing, and the duty of the spindle in combination with the valve being to start and keep up a continuous and even flow of ink. The valve consists of a properly weighted and fitted head, to which is attached a fine tapering spindle of metal passing downward through the bore of the writing point and extending a short distance beyond the extremity of the said writing point when the pen is not in use. Thus the operator when he places the point on the paper lifts the valve, allowing the ink to flow.

My invention consists further of an air conducting tube passing downward through the centre of the ink reservoir and terminating near the lower end of the said reservoir. The air tube is either left open or partly closed by a perforated diaphragm at its lower end. The object of this part of my invention is to assist the downward flow of the ink from the reservoir, and at the same time to steady the regular flow therefrom.

My invention consists, lastly, of a rod placed within and extending the whole length of the air tube, the lower enlarged end resting on top of the writing point valve, in combination with a screwed cap. The object of this part of my invention being to enable the valve to be held to its seat to prevent the escape of ink when the pen is not in use.

A.D. 1875, July 12.—No. 2499.

PATRICK, ROBERT, the younger, of the village of Branchton, in the county of Waterloo, in the province of Ontario, Canada.—"Improvements in rotary pumps and engines."

This invention has relation more particularly to improvements in that class of rotary pumps and engines in which a single cylinder or disc revolves within a cylindrical chamber; and it consists of a cylinder or disc of suitable dimensions mounted on a revolving shaft and provided with a number of sliding blades placed parallel with its axis, which blades acting in combination with certain peculiarly placed cams projecting from the inner faces of the sides of the disc encasement produce as the disc revolves a perfect or partial vacuum in the chambers or cells between the blades. Into these chambers the gas or fluid to be pumped is forced by a well known law of nature through suitably arranged passages, and as the disc revolves the fluid or gas is forced forward by the blades and discharged through other passages in a continuous stream with great force.

A.D. 1875, July 13.—No. 2513.

THAYER, LINUS ORTON, of Montreal, Canada, doctor of medicine.—(*A communication from Volney Smith, of Schenectady, New York, United States of America.*)—"Improvements in compounds for "dental plates and other purposes."

This invention consists in a compound made of gun cotton, prepared gum, shellac, gum camphor, and a compound for the body and coloring matter, together with sulphuric ether and alcohol.

The compound for the body is made of oxide of zinc, Chinese vermillion, and oxide of tin and gold.

In mixing these ingredients together the ether, alcohol, and shellac form solvents for the gun cotton; and after the ingredients have all been mixed together (which operation may be facilitated by placing them in a machine which I have constructed for this purpose), the camphor is added, and the mass is ready to be formed into plates or forms of the required shape.

For this purpose I cut up the mass into pieces of the proper size and expose to the atmosphere for six or eight days, then place them into a mould and submit to a heat of from 212° to 320° Fahrenheit while being submerged in water or a vegetable oil.

When the plate comes into the dentist's hands it is placed on a form of plaster of paris prepared for the occasion, the teeth are properly arranged thereon, and the form is again submitted to heat in vegetable oil or water at a temperature of 212° to 320°, when the plate is ready for use.

A.D. 1875, July 13.—No. 2514.

GALLOWAY, Charles John, of the Knott Mill Iron Works, Manchester, in the county of Lancaster, engineer, and **HOLT, Charles Herbert**, of Manchester, aforesaid, engineer.—" Improvements in steam " boilers."

This invention relates to the internal flues of Cornish boilers having water tubes therein. According to one improvement the flue is made with the top part concave and the bottom part convex in transverse section, the curvatures of such top and bottom parts being by preference struck from a common centre; and in the flue are fixed water tubes radiating from the aforesaid centre. Or the top or bottom is made curved, the other part being flat; and the tubes are made to radiate from the centre of the curved part. According to another improvement the flue is formed with two nearly circular parts in transverse section running into each other in the middle, where the top and bottom of the flue are formed convex; and such convex parts are connected by vertical water tubes, while in the circular parts water tubes are fixed in diagonal positions.

A.D. 1875, July 13.—No. 2520.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from William Berry Lodge, of Danbury, in the county of Fairfield and state of Connecticut, United States of America.*)—" Improvements in fulling mills."

The invention consists in the use of friction mechanism for raising the hammers or beaters in connection with a spring or springs for regulating their fall.

Also in an open work or perforated bosom for circulation of heated water, consisting of a series of rollers that assist in turning the goods.

Also in a hollow boxlike formation surrounding the bed and bosom, supplied with water heated by steam.

Also in making the toes of the beaters of india rubber or elastic material.

A.D. 1875, July 16.—No. 2553.

BOONE, John Lee, and **DETRICK, Edington**, of San Francisco, California, in the United States of America.—" An improved machine for sewing an overseam or overhand stitch."

This invention relates to an improved machine for sewing the stitch which is known as the overseam stitch.

This machine consists essentially of an independent needle operated by punches in a groove which is formed in a vibrating frame.

A break in the frame opposite the cloth plate and edges of the material to be sewed allows the frame to be moved forward untill the needle in passing across the break or space on its downward stroke or passage will pass through the edges of the material to be sewed.

The punch drives the threaded needle downwards through the material and then returns, so as to leave the needle in the groove below the material and cloth plate and on the opposite side of the break or space in the frame.

The thread is then caught by two rotating friction wheels or other device on the underside of the cloth plate and drawn through the cloth or fabric; meanwhile the frame moves back from the edge of the cloth, so as to permit the lower punch to drive the needle up again into the groove above the break or space in the frame outside of the edges of the material, ready for another forward movement of the frame and another downward movement of the needle, thus making a seam similar to the overhand stitch.

This frame can be operated either in a vertical or horizontal manner.

This machine can be constructed so as to employ either a straight needle or a curved needle. In the latter case the groove in the frame in which the needle operates will be made to correspond with the curve of the needle, and the punches will also correspond to the shape of the curve, or so as to move freely back and forth in it. The entire frame may be moved back and forth so as to allow the needle to pass alternately in one direction through the edge of the goods, and outside of the edge of the goods in the opposite direction; or one end of the frame can be hinged or otherwise loosely secured to a shaft or fixed point, so that its opposite end will vibrate back and forth in order to carry the needle in and out of the goods.

INDEX OF NAMES

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX FROM JAN. 1 TO JAN. 16, 1875,

AND TO

APPENDIXES FROM JAN. 17 TO JULY 16, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 30 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 3 with the weekly Nos. of the Index for the present year.]

A.

Abel, C. D. (*Daimler*), 71, Jan. 8, Motor engines.
—— C. D. (*Smith & Smith*), 244, Jan. 22 (*App.* 44.) [Steam-boilers.
—— C. D. (*Meunier*), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
—— C. D. (*Mathian & Solet*), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
Absalom, W., & Griffiths, E., 151, Jan. 14, Steering ships.
Acheson, G., & Kennedy, W., 40, Jan. 4, Spinning.
Alexander, E. P. (*Benwell & Humphreys*), 196, Jan. 19, [(*App.* 2.) Bale bands.
—— E. P. (*Barker*), 1633, May 3 (*App.* 45.) [Railway brakes.
Alison, J., 957, Mar. 15 (*App.* 47.) Steam-boilers.
Alston, W., 171, Jan. 16, Adjustable chairs, &c.
American Sewing-Machine Co., Hamburg- (Jensen), 26, [Jan. 22, Printing metals.
Antisell, T. M., & Bruce, De V., 2016, June 16 (*App.* 49.) [Vapor and gas-engines.
Armstrong, J., 142, Jan. 14, Railway switches.
Arnold, L., & Kidd, J., 66, Jan. 7, Gas.
Atkin, R., 92, Jan. 11, Life-boats, rafts, &c.
Aubertin, E., Boblique, L., Leplay, H., & Box, J., 181, [Jan. 16, Phosphates and phosphorus.
—— E., Boblique, L., Leplay, H., & Box, J., 214, [Jan. 20, (*App.* 3.) Disinfecting sewage, &c.
Ayton, P. E., 84, Jan. 9, Attaching knobs to spindles.

B.

Baker, D., 1577, Apr. 29 (*App.* 44.) Mariners' compasses.
—— J. M. B., 86, Jan. 9, Drying steam-boilers.
—— R., 62, Jan. 7, Jacquards.
Balestrieri, P. (Clark), 89, Jan. 9, Collecting rays of [light and heat.
Bannister, R. D., & Milligan, S. (Lake), 2245, June 18 [(*App.* 51.) Device for advertising.
Bañolas, R. (Johnson), 138, Jan. 13, Extinguishing fires.
Barker, A. (Alexander), 1633, May 3 (*App.* 45.) Railway [breaks.
Barron, W. S., & Britten, F. J., 118, Jan. 12, Centrifugal [apparatus.
Bates, F. L. (Clark), 1639, May 3 (*App.* 45.) Locking [screw nuts.
Bayliss, M., & Jones, E., 174, Jan. 16, Nuts and washers.
Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Bennett, F. G., 168, Jan. 15, Roller skates.
Benson, M. (*Redheffer*), 388, Feb. 3 (*App.* 32.) Freezing, [churning, &c.
Benson, M. (*Williams*), 437, Feb. 5 (*App.* 32.) Boots [and lasts.
—— M. (*Wicks*), 1199, Apr. 2 (*App.* 40.) Pattern [chains for looms.
Benwell, R., & Humphreys, G. (Alexander), 196, Jan. 19, [(*App.* 2.) Bale bands.
Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.) [Burning bricks, &c.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Blot, A. (Vaughan), 37, Jan. 4, Presses.
Bluck, E., 72, Jan. 8, Railway carriages.
Boblique, L., Leplay, H., Box, J., & Aubertin, E., 181, [Jan. 16, Phosphates and phosphorus.
—— L., Leplay, H., Box, J., & Aubertin, E. 214, [Jan. 20 (*App.* 3.) Disinfecting sewage, &c.
Bois, A., 45, Jan. 5, Safety guard for tram-cars, &c.
Bonnefond, A., 46, Jan. 5, Water meters.
Bonner, J., 11, Jan. 1, Weaving.
Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
—— H.A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
—— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
Bontemps, P. (Clark), 99, Jan. 11, Hydrostatic motor.
Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.) [Sewing machines.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27 (*App.* 1.) Railway signalling.
—— M. P. W., 96, Jan. 11, Hot gas & steam engines.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
—— G. T. (*Société Anonyme du Cuivre Français*), [2042, June 3 (*App.* 49.) Protosulphuret of [iron and sulphuretted hydrogen gas.
—— G.T. (*Société Anonyme du Cuivre Français*), [2084, June 5 (*App.* 50.) Kilns or ovens.
—— G. T. (*Kohrig & Pzillas*), 2486, July 10 [(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, harness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181, [Jan. 16, Phosphates and phosphorus.
—— J., Aubertin, E., Boblique, L., & Leplay, H., 214, [Jan. 20 (*App.* 3.) Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish- [ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9 [(*App.* 33.) Filling and corking bottles.
Bradley, G., & Madderson, T., 63, Jan. 7, Crushing [stones, &c.
Bray, M. (Lake), 100, Jan. 12. Rivets; setting same.

Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal
[apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21 (*App.* 30.) Valves.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P.,
[76, Jan. 8., Railway wheels and axles.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing
[electro-type shells.
Brown, W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and
[windows.
—— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
—— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
—— W. Morgan- (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of type.
—— W. Morgan- (*Johnson & Harding*), 2250, June 19
[(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12,
[Converting iron scraps, &c. into steel.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.)
[Vapor and gas-engines.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning
bricks, &c.
Burdess, A., 329, Jan. 28 (*App.* 2.) Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Bustin, R. (Lake), 185, Jan. 18 (*App.* 3.) Hanging wall
[paper.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18 (*App.* 30.) Casks.
—— T., & Thornley, G., 1518 Apr. 26 (*App.* 44.)
[Jointing cask staves.

C.

Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casson, T., 123, Jan. 13, Hydraulic engines.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
Cave, J. O'C., 140, Jan. 14, Aërial navigation.
—— J. O'C., 141, Jan. 14, Governor, steam gauge,
[safety valve, &c.
—— J. O'C., 571, Feb. 17 (*App.* 34.) Rest for knives,
[forks and spoons.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chameroy, E. A., 417, Feb. 4 (*App.* 1.) Cocks for water,
[steam, &c.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H.
(Hasseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing
[machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket
[eyes on tools.
Chaquette, E., 416, Feb. 4 (*App.* 32.) Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas,
parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 135, Jan. 14, Protecting ships, &c. from
[fire.
Clark, A. M. (*Portait & Weber*), 28, Jan. 2, Preparing
[fibres for spinning.
—— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of
[light and heat.
—— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
—— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting
[hats, &c.
Clark, A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial
[apparatus.
—— A. M. (*Johnson*), 199, Jan. 19 (*App.* 2.) Rolling
[bars for nut blanks.
—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.)
[Pumps.
—— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery
[and handles.
—— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking
[screw nuts.
—— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.*
[46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway
[for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
—— A. M. (*Lodge*), 2520, July 13 (*App.* 3.), Fulling
[mills.
—— W., 80, Jan. 9, Railway breaks.
Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8,
[Bricks, tiles, &c.
Cleveland Paper Box Machine Co. (Haseltine), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
Clough, W. R. (Haseltine), 1640, May 3 (*App.* 45.) Cork-
[screws.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and
[windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cramp, A. H., 225, Jan. 22 (*App.* 42.) Stretching boots
[and shoes.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-
[menageries.
Crocker, S. L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.* 50.) Kilns or ovens.

D.

Daimler, G. W. (Abel), 71, Jan. 8. Motor engines.
Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23 (*App.* 3.)
[Ventilating water-closets, &c.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.)
[Sewing machines.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and
[stuffing box.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8,
[Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677,
[May 5 (*App.* 45.) Paddle wheels.
Edwards, E. (*Boullenot*), 75, Jan. 8, Safety lamps.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
——— W. & J., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9
[(*App.* 33.) Filling and corking bottles.
Fewster, W., 293, Jan. 26 (*App.* 1.) Saving life and
[property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air
[engines, &c.
Fitz, E. E., 187, Jan. 18 (*App.* 30.) Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flagler, H. K. (Hunt), 290, Jan. 26 (*App.* 2.) Welding
[tubes, &c.
Fliteroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing-
[machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Foundries & Forges Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
France, W. H., 104, Jan. 12, Combing wool, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele-
[graphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for
[wood, &c.
——— M., 173, Jan. 16, Railway wheels.
Garland, H. P., 229, Jan. 21 (*App.* 30.) Sewing-machines.
——— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish-
[ing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G., & W., 179, Jan. 16, Railway signalling.
——— W. & G., 179, Jan. 16, Railway signalling.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
——— W., 129, Jan. 13, Soaps.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21 (*App.* 2.) Heating rail-
[way carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3 (*App.* 51.) Indicating
[speed of ships.
——— J., 147, Jan. 14, Sulphates.
Harrison, S. L., 461, Feb. 6 (*App.* 33.) Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4 (*App.* 32.) Balanced
[slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.* 33.)
[Filling and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.*
[33.) Rock drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App* 40.) Burning
[bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.)
[Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening
[cotton.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10 (*App.* 33.) Horse-shoe & other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Higginson, A., 108, Jan. 12, Motive-power engines and
[pumps.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13
[Cartridges.

Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers [and other boilers.
Holland, W., & *Myers, H.*, 34, Jan. 4, Umbrellas and [parasols.
Holmes, R. R., 122, Jan. 13, Aërated liquors.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.) [Steam-boilers.
Hope-Vere, C. E., 183, Jan. 18 (*App.* 3.) Cleansing china [and other articles.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop- [pering bottles, &c.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
—— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19 [(*App.* 2.) Bale bands.
Hunt, B. (*Flagler*), 290, Jan. 26 (*App.* 2.) Welding [tubes, &c.
—— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro- [magnetic engines.

I.

Imray, J. (*Tournier*), 212, Jan. 20 (*App.* 3.) Masticat- [ing, &c. food.

J.

James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*) [26, Jan. 2, Printing metals.
—— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
Johnson, G. (Clark), 199, Jan. 19 (*App.* 2.) Rolling [bars for nut blanks.
Johnson, J. H. (*Van Haagen*), 47, Jan. 5, Sharpening [drills.
—— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer- [ing, &c.
—— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing [fires.
—— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans- [mitting musical vibrations, &c.
—— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
—— *J. R., & Harding, G. P.* (Morgan-Brown) [2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, S. H., 156, Jan. 14, Cocks or valves.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
—— H. L., 492, Feb. 10 (*App.* 3.) Disinfectants and [deodorizers.
—— R. A., & Perry, J. J., 12, Jan, 1, Lighting cigars, &c.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying [apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25 [(*App.* 35.) Surfaces for steps, &c.
Kendrick, T., 31 Jan, 4, Coffin furniture.
Kennedy, W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23 (*App.* 31.) Boots.
Kidd, J., & *Arnold, L.*, 66, Jan. 7, Gas.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening [cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10 [(*App.* 3.) Sugar.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
—— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
—— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
—— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
—— W. R. (*Whittemore*), 163, Jan. 15, Spikes.
—— W. R. (*Bustin*), 185, Jan. 18 (*App.* 3.) Hanging [wall papers.
—— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour- [dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy- [menageries.
—— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting [ores; making iron; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.) [Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather [pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing [electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam- [boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18 [(*App.* 51.) Device for advertising.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14, [Punching and rivetting machines, &c.
Lee J., 131, Jan. 13, Fire-arms.
Leiter, J. (Wirth), 296, Jan. 26 (*App.* 2.) Electric [apparatus.
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—— H., Box, J., Aubertin, E., & Boblique, L., 214, [Jan. 20 (*App.* 3.) Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, J. H., 137, Jan. 13, Cigars.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c., [threads; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail [hank or shackle.
Lowe R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9, [Goffering, &c.
Luckenbach, F. A., 243, Jan. 21 (*App.* 50.) Casting and [annealing slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and [axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.) [Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.

M.

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Mackinnon, D., 2497, July 12 (*App.* 3.) Writing [instruments.
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——— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
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Marsden, B., 177, Jan. 16, Nuts for screw bolts.
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Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour- [dressing machines.
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Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14 [(*App.* 46.) Hydraulic engines, &c.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
——— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.* [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
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Miller, W. R., 24, Jan. 2, Pianos.
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Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and [windows.
——— W. (*Crompton*), 146, Jan. 14, Looms.
——— W. (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
——— W. (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of [type.
——— W. (*Johnson & Harding*), 2250, June 19 [(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood- [way for warehouses.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and [utilizing steam.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit- [ting hats, &c.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.) [Sewing-machines.
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N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Nardi, F. D., 216, Jan. 20 (*App.* 3.) Boots and shoes.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.

Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding, [&c. fibres.
Newton, H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
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O.

Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13, [Cartridges.
Outerson, A. & J., 558, Feb. 16 (*App.* 34.) Filters.
——— J. & A., 558, Feb. 16 (*App.* 34.) Filters.

P.

Paper Box Machine Co., The Cleveland (Haseltine), [1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and [engines.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Perry, J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485 [Feb. 9 (*App.* 33.) Rock drills.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2, [Preparing fibres for spinning.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23 (*App.* 3.) [Ventilating water closets, &c.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam- [boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10 [(*App.* 3.) Sugar.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank [or shackle.
Redheffer, W. (Benson), 388, Feb. 3 (*App.* 32.) Freez- [ing, churning, &c.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit- [ting hats.
Reid, W., 166, Jan. 15, Sewing machines.
Reynolds, G. H., 2287, June 23 (*App.* 52) Rock-drilling [machines.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for [floors, &c.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14, [(*App.* 46.) Hydraulic engines, &c.
Rogers, B. W., 300, Jan. 26 (*App.* 1.) Screws, bolts, &c.
——— H. (*Mullholland*), 161, Jan. 15, Cut nails.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting [ores ; making iron ; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2, [Self-acting regulator for twisting machines.

Rowland, E., 94, Jan. 11, Compressing air; raising and [forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air [engines, &c.
Rydill, G., 150, Jan. 14, Purifying sewage &c.

S.

Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting [regulator for twisting machines.
Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25 [(*App.* 35.) Surfaces for steps, &c.
Scott, G., 128, Jan. 13, Glass furnaces.
—— H. Y. D., 135, Jan. 13, Purifying gas.
—— J. (*Gerard*), 38, Jan. 4, Finishing fabrics, &c.
—— J. C., 170, Jan. 15 Moulding toothed wheels, &c.
—— J. P. (*Haag*), 236, Jan. 21 (*App.* 2.) Heating [railway carriages.
—— W. M., 186, Jan. 18 (*App.* 3.) Fire-arms.
Sellars, J. C., 112, Jan. 12, Cement.
Sewing-Machine Co., Hamburg-American (Jensen), 26, [Jan. 2, Printing metals.
Shanks, F., 1507, Apr. 23 (*App.* 43.) Carriages.
Siemens, C. W., 43, Jan. 5, Furnaces.
Silcox, D. S. (Lake), 5, Jan. 1, Kindling fires.
Silliman, C. H., & Edson, N. T. (Haseltine), 1677, [May 5 (*App.* 45.) Paddle wheels.
Simmons, C., 65, Jan. 7, Steam-boilers.
Sington, T., 57, Jan 6, Railway signals.
Sinibaldi, G. R. F., & *Sinibaldi, P.*, 136, Jan. 13, Pre- [venting formation and explosion of [gas in storage, &c. of gaseous liquids.
Sinibaldi, P., & Sinibaldi, G. R. F., 136, Jan. 13, Pre- [venting formation and explosion of [gas in storage, &c. of gaseous liquids.
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Smith, J. H., 121, Jan. 13, Sewing machines.
—— J. N., 126, Jan. 13, Railway journal boxes.
Smith, R. & J. (Abel), 244, Jan. 22 (*App.* 44.) Steam- [boilers.
—— *V.* (Thayer), 2513, July 13 (*App.* 3.) Compound [(for dental plates, &c.
Smythe, E. T. (Haseltine), 422, Feb. 4 (*App.* 32.) [Balanced slide-valves.
Solet, F., & Mathian, V. (Abel), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
Spencer, C. M., 893, Mar. 10 (*App.* 37.) Screws.
Stableford, W., 1098, Mar. 25 (*App.* 39.) Railway wheels.
Staniland. J. T., 134, Jan. 13., Perambulator brakes.
Sterne, L., 83, Jan. 9, Railway couplings.
Stokes, E. P., 143, Jan. 14, Boat-lowering apparatus.
Stormont, J. G., 1, Jan. 1, Call-bell and actions.
Stringfellow, H. W., 25, Jan. 2, Drain pipes.
Sutro, H. (Haseltine), 1479, Apr. 22 (*App.* 43.) Device [for holding thread, &c.

T.

Taft, O. W. (Clark), 1153, Mar. 30 (*App.* 40.) Table [cutlery and handles.
Taylor, R., 321, Jan. 28 (*App.* 2.) Tapping screw threads.
Thayer, L. O., 454, Feb. 6 (*App.* 33.) Fire-arms.
—— L. O. (*Smith*), 2513, July 13 (*App.* 3.) Com- [pound for dental plates, &c.
Thiery, C. L., 2367, June 29 (*App.* 1.) Watch cases, &c.
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—— G., & Buxton, T., 1518, Apr. 26 (*App.* 44.) [Jointing cask staves.
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Tomkins, A. S., 114, Jan. 12, Cooking stoves.
Tomlinson, O. (North), 130, Jan. 13, Axle-boxes.
Toppan, D. L., Chapin, G. B., & Meloon, D. C. & H. H. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
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Tournier, F. A. (Imray), 212, Jan. 20 (*App.* 3.) Mas- [ticating, &c. food.
Trabue, 661, Feb. 23 (*App.* 35.) Needles.
Tucker, T. M., & Lowerre, A. H. (Johnson), 85, Jan. 9, [Goffering, &c.
Turner, A., 154, Jan. 14, Elastic fabrics.
Turnock, J., 51, Jan. 5, Steam-engines.

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Van Haagen, C. (Johnson), 47, Jan. 5, Sharpening drills.
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Vera, P., 175, Jan. 16, Gas or hot-air engines.
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Von Faber, J. L., 178, Jan. 16, Pencils.

W.

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Walker, S., Gibson, J., & Howitt, T., 103, Jan. 12, [Stoppering bottles, &c.
Waller, G., 184, Jan., 18 (*App.* 3.) Gas.
Ward, S., & Lœwenstein, D., 78, Jan. 8, Doubling, &c. [threads; stop motions.
Warren, F. P., Brodie, W., Wilson, M., & McLay, J. C. S., [76, Jan. 8, Railway wheels and axles.
Waugh, J., 15, Jan. 1, Closing and opening bottles.
Wavish, J., 39, Jan. 4, Fire-places.
Weatherdon, B. F. (*Vigné*), 107, Jan. 12, Disinfectant.
Weber, C. P., & Portait, E. P. E. (Clark), 28, Jan. 2, [Preparing fibres for spinning.
Weldon, C. J., 77, Jan. 8, Clasps or buckles.
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Whittaker, T., Duxbury, J., & Clayton, J., 73, Jan. 8, [Bricks, tiles, &c.
Whittemore, A. (Lake), 163, Jan. 15, Spikes.
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Wilcke, H., 4, Jan. 1, Propelling screw steam ships.
Wilkinson, A., 60, Jan. 6, Compounds for paving, fuel, &c.
Willans, J. G., 157, Jan. 14, Furnaces.
Williams, H., & Evans, P., 22, Jan. 2, Stoppering bottles.
Williams, I. F. (Benson), 437, Feb. 5 (*App.* 32.) Boots [and lasts.
Williamson, C., 82, Jan. 9, Stays and corsets.
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Wilson, A. (Lake), 2234, June 17 (*App.* 51.) Steam-boiler valves.
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Wise, W. L. (*Levet*), 3, Jan. 1, Boring rock, &c.
——W. L. (*Kay*), 1461, Apr. 21 (*App.* 43.) Knot-tying
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Wright, E., 754, Mar. 2 (*App.* 36.) Transmitting and
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FROM JAN. 1 TO JAN. 16, 1875, AND TO

APPENDIXES FROM JAN. 17 TO JULY 16, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 30 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 3, with the weekly Nos. of the Index for the present year.]

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- Ice-creams. *See* Confectionary.
- India-rubber (treating and applying):
  - In making packing and coverings for surfaces, Fish, 9.
  - To stuffing-boxes of air or gas springs, Dick (*Giffard*), 55.
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- Indicating speed of machinery:
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- Insulating; insulators:
  - Legs of piano-fortes, Miller, 24.
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- Jars:
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- Jewellery:
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- Lubricating, for axle-boxes, North (***Tomlinson***), 130.
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5. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 16, 1875, and to Appendixes from January 17 to July 16, 1875.

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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 17 to January 23, 1875.

A.D. 1875, January 18.—No. 183.

HOPE-VERE, Charles Edward, of No. 4, Norfolk Street, Park Lane, in the county of Middlesex, gentleman.—" Improvements in apparatus for use in the cleansing of china, glass, and earthenware " articles of domestic use."

For the purpose of this invention a chamber or closet is employed capable of being closed by doors or shutters, and this chamber is either formed of or is lined with metal or waterproof material. Within this chamber or closet are provided racks and partitions of different dimensions; the bars forming the vertical and transverse supports, and partitions being formed of hollow metal perforated in various directions, so that fluid conducted thereto under pressure may impinge upon and act upon every part of each surface of plates, dishes, and such like articles placed in these racks.

Other parts are formed to receive and operate upon cups, saucers, wine and other glasses, decanters, and other bottles. To more effectually cleanse the interiors of decanters and other bottles, part of the closet is formed with a vertical tube perforated at its upper and other parts, so as thereby thoroughly to cleanse the whole interior surfaces, whilst other jets act on the exterior.

If desired these interior parts of the chamber or closet may be divided into several sets, so that any one may be used alone by employing a tap or valve from a main to each separate set of jets.

The cleansing liquid may be hot or cold water saturated with saponaceous or other matter to assist the cleansing.

A.D. 1875, January 18.—No. 184.

WALLER, George, of the Phœnix Engineering Works, Holland Street, Southwark, in the county of Surrey, and of the Phœnix Iron Works, Stroud, in the county of Gloucester.—" Improvements in " apparatus used in the manufacture of gas."

This invention has for its object the construction of retort lids and mouthpieces, whereby they may be sealed, or the joint between them rendered gas-tight without the aid of ordinary luting; and consists in casting upon the mouthpiece near its front end a flange with a dovetailed or other groove therein. The face or front end of the mouthpiece is cast so as to form a curved and throated flange, which partially covers the flange first mentioned. The dovetailed groove is filled with a ring cast in soft malleable metal. A lug or lugs are cast on each side of the mouthpiece; and to this lug or lugs is hinged the lid or door, corresponding lugs being also cast upon it. The door is cast with a turned up and **V** shaped edge. To the lugs before mentioned is hinged also a cross bar, which is received into a staple hinged to the mouthpiece on the opposite side to which the door is hinged, and furnished with a small screw and cross handle. When the door is closed, the **V** shaped edge of the lid is brought into contact with the soft metal ring; and upon the staple being brought over the end of the cross bar and the screw turned, such a pressure is brought to bear upon the lid as will cause its edge to bed itself in the soft metal and thus form a gas-tight joint.

A modification of the foregoing consists in casting a projection upon the flange of the mouthpiece and a recess for the reception of soft metal in the edge of the lid, the effect when the lid is closed being similar.

A second modification consists in casting a projection upon the flange of the mouthpiece, which projection together with the surface edge of the lid is turned with a flat face.

Instead of the staple having a screw, as before described, it may have inserted in the slot a roller, which is brought to bear upon the curved end of the cross bar by means of a short handle attached to the staple or slotted piece.

A.D. 1875, January 18.—No. 185.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Robert Bustin, of Saint John, New Brunswick, Canada, gentleman.*)—" An improved machine for hanging wall paper."

The first part of this invention relates to a combination of four rollers so arranged in a box that the wall paper may before being used, by passing over the central roller, be covered with paste of an even thickness. The second part of the said invention relates to a thin metal plate parallel with the rollers and so arranged as to regulate the thickness of the paste and to spread it uniformly on the paper and keep it from lumps.

A.D. 1875, January 18.—No. 186.

SCOTT, William Middleditch, of the firm of W. and C. Scott and Son, of Birmingham, in the county of Warwick, gun manufacturers.—" Improvements in breech loading small arms."

This invention consists in fixing down the barrels of drop down guns, and holding the said barrels tightly against the face of the break off by means of a projection on the upper side of each of the barrels taking into recesses, when the barrels are shut down, in the break off, sliding bolts working in the break off being shot into holes in the said projections. These bolts are worked by a lever on the tang of the break off or on the side or underside of the gun. The mechanism described is used in conjunction with a steel lump on the underside of the barrels and a sliding bolt taking into the said steel lump.

A.D. 1875, January 18.—No. 187.

FITZ, Ellen Eliza, of Saint John, New Brunswick.—" Improvements in method of mounting and " operating globes."

The purpose of this invention is to provide an instrument or apparatus for use in schools, families, etc., to illustrate and explain the manner in which the earth, in accordance with its diurnal and annual motions, presents its surface to the sun's rays, the especial object being to ascertain the various durations of day, night, and twilight throughout the year, at any given terrestial positions or localities, and also in treating of day to ascertain the points of the rising, setting, and culmination of the sun, and the various courses the latter pursues in its relation to different horizons.

A.D. 1875, January 18.—No. 188.

THORNLEY, George, and **BUXTON,** Thomas, of Burton-upon-Trent, in the county of Stafford, engineers.—" New or improved machinery for partially preparing wood staves for the manufacture of " casks."

The novelty in this case consists :—

Firstly, in so arranging machinery that wood staves for casks are prepared on both sides, or " hollowed " and " backed " at one and the same time.

Secondly, in so arranging the cutters, guides, and the bed on which the staves are dressed, that bent, twisted, and otherwise mis-shapen staves are easily and properly dressed.

Thirdly, lowering and raising the cutters by a cam or eccentric, for hollowing staves to a gradually varying thickness from their centres towards each end.

A.D. 1875, January 18.—No. 189.

WORRALL, Joseph, and **WORRALL,** Arthur John, both of Hathersage, in the county of Derby.— " Improvements in machinery or apparatus for shaping wire and cutting up the same into lengths."

Our invention relates more particularly to the drawing or turning up and cutting off into lengths of paragon wire, to be used in the manufacture of the ribs and stretchers of umbrellas, but it is also applicable to the shaping and cutting of wire to be employed for other purposes, and it consists of a peculiar arrangement of apparatus for automatically gripping and drawing forward the wire through dies or rolls, and cutting it up into lengths, in combination or not with rolls for straightening such wire, whereby the before mentioned operations are greatly expedited, and facility is afforded for performing the same by the aid of steam or other motive power.

A.D. 1875, January 18.—No. 190.

ENOCH, Elijah, of 26, Selby St., Hull, in the county of York.—" Improvements in machinery or " apparatus for boring or drilling."

My invention relates to portable machinery or apparatus which is specially adapted for drilling or boring holes in the rails of permanent way, the flanges of cylinders, valves, pipes, or columns, but which is also applicable to a variety of general work; and it consists of an improved combination of ratchet brace or other motion for turning a drill, with a cramp or fixture for securing it to the work to be operated upon, whereby the weight and bulk of the apparatus are diminished, great simplicity in attaching it to or removing it from the article to be drilled is secured, and firmness and rigid resistance to the pressure required for drilling, with other advantages are obtained.

A.D. 1875, January 18.—No. 191.

JOHNSON, Samuel, of East India Road, in the county of Middlesex, and **ALLAN**, William, of Greenwich, in the county of Kent.—" Improved apparatus for heating feed water supplied to boilers, " and also for condensing surplus steam in boilers."

This invention mainly consists in arrangements of pipes and condenser or heater acting in conjunction with donkey engine so as, firstly, to save marine boilers from the destruction caused by pumping cold water into them while under steam.

Secondly, to save the great quantity of steam which has now to be blown into the air through waste steam pipes when steamers are entering harbours, or at any time when boilers are obliged to be kept under steam without the main engines being at work.

A.D. 1875, January 18.—No. 192.

TAYLOR, George Noble, of South Kensington, in the county of Middlesex.—(*A communication from Ralph Neufville Taylor, of Coorg, in the Presidency of Madras, East Indies.*)—" Improvements in lamps " for streets and other places."

The lamp is made of a glass cylinder or inverted truncated cone dropping in a frame on the lamp post and secured by a flange on the bottom edge taking into recesses made in the arms of which the lamp frame is composed.

A.D. 1875, January 18.—No. 193.

WIRTH, Frank, of the firm of Wirth and Company, patent agency, of Frankfort on the Main, in the Empire of Germany.—(*A communication from Otto Emmerich, Lieutenant, a person resident at Aschaffenburg, in the Kingdom of Bavaria.*)—" Improvements in fire-locks, especially applicable to " the 'Henry rifle'."

This invention relates to various improvements in fire arms, especially applicable to the arm known as the " Henry " rifle.

A.D. 1875, January 19.—No. 194.

KUENEMANN, Jean Baptiste, of 13, Rue St. Florentin, Paris, in the Republic of France, at present residing at the Hotel de Paris et de l'Europe, Leicester Square, in the county of Middlesex. —(*A communication from Paul Magner and Edward Kunemann, M.D., both of New Orleans, in the United States of America.*)—" A certain new and useful process in the production of glossiness, and " the application of mordants and dye on vegetable textiles."

According to this Provisional Specification the textile material is converted into cellulose, and it is deoxidised preparatory to mordanting and dyeing.

A.D. 1875, January 19.—No. 195.

DUFRENÉ, Hector Auguste, of No. 10, Rue de la Fidélité, Paris, in the Republic of France, and 4, South Street, Finsbury, London, civil engineer and patent agent.—(*A communication from Auguste Jules Junius Lévêque, a person resident at Blangez sur Bresle, in the Republic of France.*) —" An improved railway sleeper."

This invention consists in the employment of billets of wood in the bark or without the bark, of small dimensions, for making railway sleepers; and in connecting them at their lower part with base plates, and at their upper part with the rails.

A.D. 1875, January 19.—No. 196.

ALEXANDER, Edwin Powley, of 14, Southampton Buildings, in the county of Middlesex, consulting "engineer.—(*A communication from Richard Benwell, and George Humphreys, both of Alexandria, Egypt, engineers.*)—"An improved stud or button for fastening the ends of metal bale bands."

This invention relates to a peculiar loose stud or button for bale bands and consists of a button having a shank of square or other section and of a length rather greater than the combined thicknesses of the two overlapping ends of the bale band, through holes in which the loose stud or button is inserted. The shank of the button is disposed eccentrically to the upper and lower heads, the main portions of which project or overhang respectively to the right and left of the shank or vice versa, a very small lip or projection being left on the sides of the shank opposite to the main projecting portions of the heads.

A.D. 1875, January 19.—No. 197.

ROSS, Owen Charles Dalhousie, of Craven Street, Strand, in the county of Middlesex, civil engineer. —"Improvements in apparatus and means for utilizing petroleum and other hydrocarbon liquids in "lieu of coal or other fuel."

This invention mainly relates to a shallow vessel termed a "carburettor," constructed with several orifices, through one of which atmospheric air is to be drawn or driven, and through such one of the others as may be selected by the operator it will emerge more or less saturated with hydro-carbon vapor in a state in which it is inflammable. This carburettor should be so partitioned interiorly as to allow of the current of air passing over the surface of the liquid in a long and continuous current, and the channel to which the air is confined should be capable of regulation so as to admit more or less vapor. Various subsidiary details are given. In lieu of atmospheric air gases of an inferior quality are employed, such as poor coal gas, wood, or peat gas, decomposed steam, carbonic acid or oxide, more or less diluted with nitrogen or other vapors.

A.D. 1875, January 19.—No. 198.

CLARK, Josiah Latimer, of 5, Westminster Chambers, Victoria Street, Westminster.—"Improve-"ments in gas regulators and in lighting railway carriages by gas."

This Specification describes pneumatic apparatus under the control of the guard or engine driver to partially turn the gas off or turn it on to the burners; also an elastic regulator to prevent the flickering of the gas flames now caused by the oscillations of the reservoirs at the top of the carriages. Also preventing oscillations in the ordinary fluid regulators employed for regulating the pressure of gas as it passes to gas burners by admitting gas to the interior of the drum only by a contracted aperture or by contracting the communication between the fluid in the interior of the drum and that on its exterior.

A.D. 1875, January 19.—No. 199.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from George Johnson, of Haverstraw, in the county of Rockland, state of New York, United States of America.*)—"An improvement in machines for rolling bars for nut blanks."

This invention consists in employing a revolving notched clearer in combination with rolls for rolling notched bars, said clearer being geared with the rolls so that its notches will mesh with the bar, thereby avoiding the injury to its corners to which it is subject with an ordinary stationary clearer.

A.D. 1875, January 19.—No. 200.

MACKAY, Murdock, of Mark Street, Finsbury, in the county of Middlesex, practical chemist.— "Certain compounds for dissolving resins and gum resins and for other purposes for which alcohol or "methylated spirit is now employed."

Adding to methylated spirit one or other of two certain combinations herein-after stated, or a certain article herein-after stated, and stirring till the mixture becomes opaque or turbid, and then adding more methylated spirit till it becomes clear. The combinations are termed No, 1 and No. 2. No. 1 consists of one part of benzoline to six parts of mineral or coal naptha, or one part of turpentine to six parts of mineral or coal naptha. Or half one part of benzoline and half one part of turpentine may be substituted for one whole part of either.

No. 2 consists of one part of turpentine to three parts of benzoline. The said certain article is benzoline, which is employed in the proportion of one part of benzoline to three of methylated spirit or any other hydro-carbon (employed in suitable proportions) may be substituted for benzoline.

Instead of combination No. 1, mineral or coal tar naptha may sometimes be employed.

The proportions stated may be varied.

A.D. 1875, January 19.—No. 201.

BRIERLEY, John, BRIERLEY, Frederick Wade, and BRIERLEY, Walter Wright, all of Kilburn, in the county of Middlesex, railway signal engineers, and **REYNOLDS, Francis Samuel**, of Edgware Road, in the same county, surveyor.—"Improved apparatus for locking and interlocking railway "signals and points."

This invention has for its object the more perfect locking and interlocking of switches and facing points on railways with the signals, so that it will be impossible for the attendant in the signal box who works the signals to make a mistake and cause a train to run on to a wrong line of rails or for him to lower a signal until the proper line is open for the passage of the train.

A.D. 1875, January 19.—No. 202.

GRAHAM, John Cameron, of Ballewan, Stirlingshire, Scotland, and 4, Croom's Hill, Greenwich, in the county of Kent.—"Improvements in boilers for steam-engines."

The object of my invention is to increase the evaporative power of boilers, and by certain arrangements of hoods or plates over the tubes and furnaces to prevent that peculiar action called priming.

My object is to increase the rapidity of these currents and to make them more regular in their action.

I fix over each nest of tubes, or over them all if there are no spaces between the nests, a hood or hoods or inclined plates with an aperture at the top, so that the whole of the steam and water constituting the upward current has to pass through this contracted aperture. The aperture may be above or near the water level.

A.D. 1875, January 19.—No. 203.

DIX, Alexander Mills, of Shelton, Stoke-on-Trent, in the county of Stafford.—"Improvements in "axles for wagons, carts, carriages, and other vehicles."

This consists in fitting divided axles to wagons and other vehicles, the inner ends being clipped in a special form of box to revolve therein.

The wheels are in most cases a fixture upon the axle ends, and the axles work in bearings attached to springs bolted to the body.

A.D. 1875, January 19.—No. 204.

JOLIOT, Jean Pierre Salomon, of Boulevard de Strasbourg, 23, at Paris, merchant.—"Improved "machinery for stopping railway carriages, waggons, and trucks."

The object of this invention is to construct break machinery the action of which is instantaneous, that is to say, which acts immediately on the attendant operating a releasing lever. The result of this movement of the lever is that two flanged excentrics which are jointed to the carriage frame fall on the rails of the railway. Owing to the onward movement of the train the excentrics lift conjugated twin levers, the short arms of which are flanged shoes, which thus press on the rails to stop the train.

A.D. 1875, January 19.—No. 205.

JEYES, John, of Richmond House, Plaistow, in the county of Essex, chemist, and **TURNER, Charles Hamilton**, of Great Winchester Street, in the city of London, manufacturer.—"An improved "lubricating apparatus."

Our invention relates to an apparatus for lubricating in an economical and convenient manner shafts, axles, and other working parts of steam engines and other machinery where it is desirable to have a constant and uniform supply of oil or other fluid lubricant. We use a cup or vessel, the lower part of the same being fitted with a washer, through which we pass a plug of pumice stone or other similar substance.

A.D. 1875, January 19.—No. 206.

GARDNER, Charles Frederick, of Bishopsgate Street Within, in the city of London.—(*Partly a communication from Lyman Reed Blake, of Paris, France.*)—"Improvements in machinery for shaping, "channeling, and feathering the soles of boots and shoes."

This invention relates to improved machinery for "rounding" or cutting to a given shape the pieces of leather or other material intended to form the soles of boots or shoes, and for cutting the channel in them, and for feathering their edges.

A.D. 1875, January 19.—No. 207.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, No. 8, Southampton Buildings, London.—(*A communication from J. R. McClintock, of New Orleans, Louisiana, United States of America.*)—"An improved process for preserving vegetable and animal substances."

This invention relates, first, to the dry fumigation of the articles to be preserved by subjecting the same to the action of the gases or fumes generated from a compound of powdered sulphur and charcoal. After the process of dry fumigation has been completed the said article or articles must be submerged in water thoroughly impregnated with the gas or vapor generated from the same composition.

A.D. 1875, January 19.—No. 208.

TAUNTON, Richard Hobbs, of Wilton, in the county of Warwick, HAYWARD, George, of Acock's Green, in the county of Worcester, and KNAP, Conrad, of Gravelly Hill, in the county of Warwick. —"Improvements in the manufacture of wrought iron tubes."

The improvements relate to the machinery employed for forming the strip into a skelp previous to its being passed into the welding rolls, such operation being performed with great rapidity whilst the strip is under welding heat and passing from the furnace to the welding rolls.

A.D. 1875, January 20.—No. 209.

JOHNSON, John Clark, of Wednesbury, in the county of Stafford, engineer.—"Certain improve- "ments in forming strip iron into skelps, and welding the same into tubes, applicable for gas, steam, "water, or other purposes; and in apparatus employed therefor."

The object and purpose of my improvements in the manufacture of welded iron tubes consist in the use of shaping rolls (with or without the additional use of a shaping die), and the welding of tubes by passing the skelps between the grooves of rolls placed one above the other, the top roll having the quality of being bodily elevated and returned to its work by a simple or compound lever, the said rolls being fitted and secured to a fixed or moveable stage or base.

A.D. 1875, January 20.—No. 210.

DORAT, Honoré Jules, of Paris, in the French Republic, (temporarily residing at Gower Street, Bedford Square, in the county of Middlesex) gentleman.—(*A communication from Adrien Clement Lucien Grave, of Paris, aforesaid.*)—"Improvements in gas burners, gas regulators, or apparatus for lighting "by gas."

Caps or chambers formed with openings of gradually reduced or differential sectional area are provided behind or below the burner end or nipple, so as to conduct the gas thereto from the pipe at a differential or controlled pressure and thus prevent whistling or irregularity. The openings should be so contrived that the gas shall issue from each chamber in a direction at right angles to the direction of entry.

AD. 1875, January 20.—No. 211.

MATHER, John, of Gateshead-on-Tyne, in the county of Durham, engineer.—"Improvements in "the means for producing gas from an admixture of atmospheric air with parafin, petroleum, naptha "oil, or spirit containing a large amount of carbon, the said gas being adapted for lighting or "heating purposes."

Atmospheric air rushing through a jet produces a vacuum in a small chamber or generator, into which also opens a jet from a vertical tube descending into a cistern containing the carboniferous fluid. This vacuum causes the fluid to ascend the tube and to issue from the jet in a spray, which combines with the air rushing by. This combination is carried forward along a tube that passes through a furnace or oven, and finally conveyed in a gaseous state to the hydraulic main, and thence to store tanks.

A.D. 1875, January 20.—No. 212.

IMRAY, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from François Aimé Tournier, of Longchaumois, Jura, France.*)—" An improved instru-" ment or apparatus for bruising, masticating, or disintegrating food."

This invention relates to an instrument or apparatus for use at meals by persons deficient in teeth. The instrument has arms like nutcrackers with projecting ribs and hollows alternating in the jaws thereof, so that by working the arms to and from each other, morsels of food placed between the jaws are bruised, masticated, or disintegrated before being placed in the mouth.

A.D. 1875, January 20.—No. 213.

SHAND, George, of Stirling, in the county of Stirling, North Britain, manufacturing chemist.—" Improvements in treating, improving, or maturing spirits, wines, malt liquors, and other liquids " containing alcohol."

The invention consists simply in systematically exposing the liquid to the maturing and ripening action of sunlight.

A.D. 1875, January 20.—No. 214.

BOX, John, of 20, Great George Street, Westminster, civil engineer, **AUBERTIN, Edouard**, of No. 66, in the Boulevard of Strasburg, in the city of Paris, gentleman, **BOBLIQUE, Leopold**, of No. 72, in the same Boulevard, chemist, and **LEPLAY, Hypolite**, of Ruelle des Meuniers, No. 4, at Bercy, in the city of Paris, chemist.—" Improvements in the disinfection of solid and liquid matters such as night soil " sewerage, either together or separately, gas, and other foul waters."

We employ a soluble alkaline phosphate and a soluble salt of magnesia and oxide or other form of iron. We employ these agents in different combinations. We prefer phosphate of potash or ferruginous soda prepared by calcination in a reverbatory furnace, the phosphate of iron with the sulphate of soda and a soluble salt of magnesia such as the chloruse of magnesium. The liquid to be disinfected is allowed to run through the raw products as they leave the reverbatory furnace; the sulphuretted hydrogen is deposited in the state of sulphate of iron. To the liquid thus deprived of the sulphuretted hydrogen soluble salt of magnesia is added; magnesiam phosphate of ammonia is formed and precipitates itself with the azoted organic matters. To disinfect solid matters the same products are used dry in powder. We also employ phosphate of lime dissolved in hydrochloric acid, and oxide of iron also dissolved in chlorhydric acid.

A.D. 1875, January 20.—No. 215.

MARLER, Edwin Thomas, of Union Bank Buildings, Holborn Circus, London.—(*A communication from Joseph Reckendorfer, of New York, in the United States of America.*)—" Improvements in pencil " cases or pencil holders."

The case or holder is channelled internally to receive the lead. It has at one or both ends a slotted conical cap. A collar or clamp working on a screw thread binds the cap so as to adapt it for various sizes of leads. A watch key or other appendage may be attached at one end of the case or holder.

A.D. 1875, January 20.—No. 216.

NARDI, Francesco Dominique, engineer, of 13, Rue Gaillon, Paris.—" Improvements in machines " for blocking the uppers of boots and shoes."

This invention consists in the use of a plate of metal, the lower edge of which is cut to the shape of the upper or front part of the shoe, the upper face being cut to correspond with the back part of the shoe; it has a to and fro motion between cheeks, and the upper being drawn through it by appropriate mechanism it assumes the exact shape cut out on the plate.

A.D. 1875, January 20.—No. 217.

SMITH, Wade Hampton, of Edgbaston, Birmingham, in the county of Warwick, civil engineer.—"Improvements applicable in the treatment and manufacture of metals and their alloys."

This invention consists mainly in the improvement and purifying of iron, steel, copper, lead, zinc, nickel, and their alloys, and treating and manufacturing the same in prescribed manner in converters, cupolas, receivers of metal, or any other suitable vessel or vessels; and consists of introducing into or upon iron, steel, copper, lead, zinc, nickel, and their alloys, when in the above named vessels and in a molten or liquid state, alumina, lime, soda, potass, and baryta, either mixed or separate, with oxides of iron, manganese, titanium, vanadium, tunsgten, and chromium, either manufactured or in the natural metallic form; and I use them either singly or together, and in such proportion or proportions as may be required, with or without solid or gaseous carbons. It also consists in an improved arrangement of tuyeres as applied to such converters or vessels.

A.D. 1875, January 20.—No. 218.

PERKINS, Stanhope, of Fairfield, in the county of Lancaster, engineer, and **SMELLIE, William**, of Gorton, in the said county, forge manager.—"Improvements in furnaces for heating and melting "metals."

This invention relates to a method of introducing heated air to the furnace.

A.D. 1875, January 20.—No. 219.

EKSTRÖM, Axel Hjalmar August, engineer, of Hamburg.—"Improvements in apparatus for "bringing centrifugal pumps in action."

This consists in arrangements of mechanism by which the pressure of air in the delivery and suction pipes of centrifugal pumps which hinders the rising of the water is removed by a jet of steam.

A.D. 1875, January 20.—No. 220.

McPHAIL, William, of Wicklow, in the county of Wicklow, Ireland, printer.—"Improvements in "compositors' case frames."

My invention relates to improvements in compositors' case-frames, the object and nature being to bring a large amount of working material within narrow limits conveniently disposed for immediate use.

A.D. 1875, January 20.—No. 221.

RAMSDEN, John Carter, of Smith House, Lightcliffe, in the county of York, silk manufacturer.—"An improved construction of driving band, specially adapted for driving the spindles of spinning, "twisting, doubling, or winding machinery, also applicable for other like uses."

The object of this invention is the construction of a combined metal and fibrous driving band, having elasticity and self-adjustment to any stretching or elongation of the fibrous portion of such bands.

A.D. 1875, January 20.—No. 222.

HARVEY, Joseph, of Heron House, Heron Court, Richmond, in the county of Surrey.—"A close or "open carriage on a pair of wheels may be driven from the outside or inside with single or a pair of "horses."

A close or open carriage on a pair of wheels may be driven from the outside or inside with single or a pair of horses, combining perfect safety, ease, and comfort, and of light draught.

A.D. 1875, January 20.—No. 223.

BULLIVANT, William Munton, of 59, Fenchurch Street, in the city of London.—"Improvements in "floating anchors to enable disabled steamers and other vessels to ride out heavy gales."

This Provisional Specification describes a floating anchor composed of a canvas bag of conical form strengthened with wire rope. This bag when out of use folds flat, but when in use the water keeps it distended.

The bag when required for service is connected by means of a short wire rope with a raft constructed of deals placed on edge with distance pieces between them and the whole tied together with through bolts.

A.D. 1875, January 20.—No. 224.

PERKINS, Loftus, of Seaford Street, Gray's Inn Road, in the county of Middlesex.—"Improvements " in marine, and other steam engines, and apparatus connected therewith, parts of which improve" ments are applicable to other purposes."

This Specification describes an engine formed with two high, two medium, and a low pressure cylinder; steam is expanded from the high pressure cylinder into the intermediate cylinder, then into the opposite end of the same cylinder which is opened to a chamber surrounding the high pressure cylinder, and then into the low pressure cylinder. Piston valves of peculiar construction are used for the steam and exhaust. The pistons of the steam cylinders are provided with several rings or sets of rings each enclosed in a steam tight recess and forms in itself a perfectly packed piston. A peculiar construction of surface condenser is described and arrangements to prevent all access of salt water to the water used for working the engines. Each boiler is fed by separate feed pumps—independent air circulating and feed pumps driven by a separate engine are provided. A peculiar construction of mica water guage is used—An arrangement of distilling apparatus worked from the steam boilers is described, and also a salt water steam generator for working donkey engines and other uses.

A.D. 1875, January 20.—No. 225.

CRAMP, Alfred Henry, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London.—"An improved apparatus for stretching boots and shoes."

My invention relates to novel apparatus by which all parts of a boot or shoe may be stretched to any required extent. I construct this improved apparatus as follows, that is to say, I use a last made with a heel part separate from its front part. These two parts of the last may be formed of wood or metal, and are made hollow and fitted with adjusting mechanism.

A.D. 1875, January 20.—No. 226.

LLOYD, John, paper stainer, and **SCULLY, James**, both of Whiteinch, in the county of Lanark, North Britain.—"Improvements in hanging lines for drying wall and other papers, and also textile or " other web fabrics."

The features of novelty which constitute this invention are hinging laths or bars to an endless travelling chain or band, and the arrangement of guide apparatus whereby they are caused to assume a horizontal and vertical position; also the feeding arrangement of endless chain or band and bars or arms whereby the textile or web fabric is placed upon the aforesaid laths or bars.

A.D. 1875, January 21.—No. 227.

BLAKEBOROUGH, Robert, of Brighouse, in the county of York, and **BECK, John**, of Pemberton Row, Great New Street, in the city of London, engineers.—"Improvements in hydrants and fire" cocks."

This invention consists in the combination of two distinct valves in a hydrant, the one valve being used in the ordinary manner and for the usual purpose, whilst the additional valve is employed solely for shutting off the hydrant from the main in case of repairs, by which arrangement the rest of the hydrants attached to the main are left in free operation and the necessity for emptying the main is obviated. The improvements in fire cocks have for their object greater compactness by dispensing with the ordinary projecting branches, and consist in casting a hollow belt round the supply pipe, and making the valve seat directly on the surface of the pipe itself, inside the said hollow belt, a short exit nozzle being fitted to the outside of such belt.

A.D. 1875, January 21.—No. 228.

MOREAU, Eugene, of San Francisco, in the county of San Francisco and state of California, one of the United States of America, engineer.—"Improvements in sewing machines."

The said invention relates to the combination with the needle of a sewing machine of hooks opening outwardly and expanding the thread sufficient to admit the passage of the shuttle to form the loop. Also to the employment of cast off pins in combination with the said hooks. Also to the combination of the shuttle with guiding rods, the shell of the shuttle being provided with a tube or opening. Also to the combination of the said hooks with cams.

A.D. 1875, January 21.—No. 229.

GARLAND, Howard Pratt, of San Francisco, in the county of San Francisco and state of California, one of the United States of America, engineer.—"Improvements in sewing machines for stitching sacks, bags, carpets, and other like purposes."

My said invention relates to improved means for operating spiral needles in sewing machines for sewing sacks or bags and the like; and it consists mainly in the employment of friction rollers for actuating the needles, the spirals of the needles being serrated or notched on their edges, so as to engage the rollers; also to notched discs which are revolved by the spirals of the needle as it is turned, and to other details of construction and operation.

A.D. 1875, January 21.—No. 230.

CHEATLE, James Hill, of Birmingham, brush maker,—"An improvement in brushes."

This invention consists in forming the body of the brush of two elongated semi-circular pieces of wood recessed in each of their flat faces, so that the air can be drawn through holes made therein and set in position by wires, the ends of which are pressed flat in the recesses; and in uniting these semicircular pieces by a metallic band encircling them centrally in their length, the ends of the band being held fast in a metallic socket so as to hold the said pieces firmly together to form the body of the brush, and so as to allow the brush when partially worn to be rotated in the band to a fresh and unused part.

A.D. 1875, January 21.—No. 231.

BROADBENT, Thomas, and WESTERBY, Joseph, both of Huddersfield, in the county of York, engineers.—"Improvements in the method of and apparatus for regulating the cut off valves in steam engines with the governor."

The back of an ordinary slide valve worked by an eccentric is prepared for a cut off; instead of being straight planed and the ports parallel to each other, we make it concave, radiating from the centre of cut off valve spindle, and the ports we make in a diagonal or helical position; the cut off valve is convex and made to fit back of slide valve, and the ends cut to the same pitch as the ports; to this valve a reciprocating motion is given by means of a common eccentric. To the cut off valve spindle is secured a toothed segment, broader on the teeth than the travel of the valve, into which is geared a worm on a diagonal shaft, with ball coupling and suitable connections to the governor, by which means the cut off is regulated to a greater nicety than hitherto, and without the intervention of any throttle valve, which has a tendency to wire draw the steam and prevent the full boiler pressure being put upon the piston.

A. D. 1875, January 21.—No. 232.

RATH, Ferdinand, of Goldsmith Street, in the city of London, and **SCANTLEBURY, William,** of Holloway, in the county of Middlesex.—"Improvements in creased, folded, or plaited fabrics, and in machinery or apparatus used for this purpose."

This invention relates first to improvements in creased, folded, or plaited fabrics, such as or similar to those used for ladies' collars, trimmings, and other like purposes; and secondly the improvements relate to the machinery or apparatus employed for this purpose.

According to the first part of the improvements, in place of forming the plaits or folds transversely at right angles across the length of the fabric to be creased, folded, or plaited, they are formed diagonally or at an angle across the fabric, or the folds or plaits may have a curved or zig rag form or outline imparted thereto.

The folds or plaits may be afterwards crossed by passing them a second time between the rollers.

In carrying out part of the improvements an endless band is employed, composed of endless chains or bands upon which a series of bars are mounted. In combination with the endless band of bars a heated roller is arranged to revolve, the surface of which is formed with a series of teeth or bars which enter between or engage with the bars carried by the endless chain or band before mentioned. The fabric is fed in between the surface of the roller and endless band of bars, and is thus creased or plaited, and as it is delivered it comes in contact with a hot box or ironing apparatus, which lays and perfects the previously formed plaits or folds.

In place of employing an endless band and roller as previously described, two endless bands of bars may be arranged so as to obtain a like result.

A.D. 1875, January 21.—No. 233.

PERRY, Joseph John, of Red Lion Square, in the county of Middlesex.—" Improvements in wheel " skates."

The invention consists in forming the front wheels of boxwood, cast metal, or other hard material, and the hind wheel of india rubber.

A.D. 1875, January 21.—No. 234.

GILLMAN, Alexander William, and **SPENCER**, Samuel, both of Castle Brewery, Saint George's Road, Southwark, in the county of Surrey, consulting practical brewers and analytical chemists.— " An improved mode of treating and bottling beer, and improvements in apparatus employed " therein."

The invention consists in driving out the atmospheric air from the beer, which may have become absorbed thereby; and in charging such beer with carbonic acid gas under considerable pressure by means of suitable apparatus.

A.D. 1875, January 21.—No. 235.

INGRAM, James George, of Wilmer Gardens, Hoxton, in the county of Middlesex.—" Improvements " in washers and packing-pieces."

The invention consists in forming washers or packing pieces on one face thereof, with a projection or projections to enter the interior of one of the tubes or parts to be connected together, and thus ensure the washer or packing piece being placed in correct position.

A.D. 1875, January 21.—No. 236.

SCOTT, John Peers, of Manchester, in the county of Lancaster, engineer and exporter of machinery. —(*A communication from John Haag, of Augsburg, in the Kingdom of Bavaria, machinist and tube manufacturer.*)—" Improvements in apparatus for heating and warming railway carriages by steam."

This invention consists in the application of wrought iron tubes welded at both ends, and with a flange in the middle in which the regulating valves are connected. Also in constructing the regulating steam valve so that it can be opened and shut inside the compartments of the carriages. Also in introducing the steam into warming tubes placed under the seats in the carriages. Also in a self-acting valve which is placed between the two carriages. Also in making all the joints of the warming apparatus of solid metal.

A.D. 1875, January 21.—No. 237.

LEWIS, Richard Thomas, of Liverpool, in the county of Lancaster.—" Improvements in and applicable " to ornamenting and hermetically sealing the backs of toilet and other detached looking glasses and " mirrors."

My invention consists in forming an ornamental covering or backing for looking glasses, by preference of japanned tin, papier maché, enamel, glass, china, porcelain, or other suitable material. Such covering or "backing" I make especially ornamental by painting, enamelling, staining, or otherwise delineating any ornamental device thereon, such as groups of flowers, arabesques, or other artistic designs. This covering or backing may be set in the framework that carries the looking glass and at the back thereof by the aid of white lead, putty, composition of india rubber, or other suitable matter that will hermetically seal the silvered glass in the frame. Or the ornamental covering or "backing" before described may be affixed by suitable fastenings over the frame of the looking glass and at the back thereof.

A.D. 1875, January 21.—No. 238.

CUNLIFFE, Richard, of Manchester, in the county of Lancaster, engineer.—" Improvements in " railway chairs, and in apparatus for locking the nuts of screw bolts for railways and other " purposes."

My improvements in railway chairs consist in securing the rail to the chair by means of a wedge which is pressed downwards by a screw. In joint chairs the wedge must be long enough to overlap the ends of the rails. The screws are tapered with the larger diameter near the point.

My improved apparatus for locking nuts consists of a strip of wrought iron which is placed over the ends of the bolts, and the edges of the strip are notched out to the size of the nut and raised by a chisel when the nuts have been screwed home.

A.D. 1875, January 21.—No. 239.

HAINSWORTH, Marshall, of Ilkley, in the county of York.—" Improvements in the means or " apparatus employed for extinguishing fires."

One or more perforated pipes are conveyed into room or compartments of ships; through which water is forced when required; suitable stop cocks are provided.

A.D. 1875, January 21.—No. 240.

HOWARTH, John, of Bradford, in the county of York, superintendent of baths.—" Improvements in " hot-air stoves and apparatus for warming and ventilating buildings, which apparatus may be used " for drying wool, yarn, or other material."

This invention relates to constructing stoves of wrought iron having a fire chamber and moveable fire bars; round the fire chamber is fitted a casing forming a hot air chamber, and the underside of the stove is open to admit atmospheric air; this air coming in contact with the fire chamber becomes heated and travels through pipes so arranged that two or three or more rooms can be heated at the same time; over the smoke pipe is also fitted a casing in which is fixed a cold air pipe to admit atmospheric air; this air travelling in the air spaces of the casing becomes also heated; dampers are used to regulate the fire.

For heating large buildings and drying wool, yarn, and other material the apparatus is formed of a fire-brick furnace, the top of the brickwork is covered with a wrought iron plate having a hole in which is fitted a fire-clay tube and expansion joint connecting the furnace with a long cylinder, in which enter the fire and smoke passing on through smoke pipes to the chimney; the cylinder and smoke pipes have casings forming hot air chambers; atmospheric air is forced by means of a blower or fan to travel through the casing of the smoke pipes and through the casing of the cylinder, getting heated, and is forced through pipes into the rooms of the building, or used for drying wool, yarn, or other material.

A.D. 1875, January 21.—No. 241.

FURRELL, Edward Wyburd, of Laurence Pountney Hill, in the city of London, civil and mechanical engineer.—(*A communication from James Browne, of the city of Toronto, in the province of Ontario, and Dominion of Canada, banker.*)—" A new or improved stand for holding charts and other illustrations."

This invention consists of an arrangement of one or more metal tubes or bars sliding vertically and telescopically within each other in an upright stand, the upper or inside tube being fitted near its upper end with a horizontal cross-bar in such a manner that a chart or other illustration suspended from the said horizontal cross-bar may be raised or lowered at pleasure.

A.D. 1875, January 21.—No. 242.

SERRIÈRE, Joseph, of Lyon, (France), engineer.—" Improvements in furnaces for burning moist " ligneous residues, wood, tan-waste, or other moist vegetable substances."

The object of this invention is to construct furnaces for burning ligneous residues much charged with water, such for example as tan waste and spent dye woods, with or without the simultaneous employment of coal, anthracite, lignite, or peat, and without previous drying or pressure.

A.D. 1875, January 21.—No. 243.

LUCKENBACH, Frederic Augustus, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London.—" An improved method of and apparatus for casting " and annealing furnace slag or cinder."

My said invention relates to further improvements in the treatment of furnace slag or cinders for the manufacture of various articles described in the Specification of former Letters Patent, dated 23rd May, A.D. 1872, No. 1585.

A.D. 1875, January 22.—No. 244.

ABEL, Charles Denton, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex. —(*A communication from Richard Smith and John Smith, both of Three Hill Gates, Moscow, in the Empire of Russia.*)—"Improvements in steam boilers and their setting."

This invention relates to various modifications of that class of steam boilers in which one or more upper cylindrical compartments are connected by vertical water tubes to one or more lower compartments. The improvements consist in placing the furnace of the boiler below the lower compartments, arranging the flues to circulate backwards and forwards, passing from below the lower compartments between the upper and lower compartments, and along the upper ones to the chimney; also in providing passages in the boiler setting for heating the air required for the furnace; also in arranging tiers of three compartments, one above the other, connected by water tubes and with furnaces below the lower compartments; also in constructing the lower compartments as cornish boilers with internal flues and firegrates; also in constructing the upper compartments as tubular boilers, the gases being made to pass through the tubes after circulating through the flues of the boiler.

A.D. 1875, January 22.—No. 245.

MASON, William, of Leeds, in the county of York, corn merchant.—"A new and improved method "for the prevention of the incrustation of steam engine boilers."

The introduction of plumbago into steam engine boilers for the prevention of incrustation.

A.D. 1875, January 22.—No. 246.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 23, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from Darius William Siprell, of Rivière du Loup en bas, in the county of Temiscouata, in the province of Quebec, Canada, machinist.*)—"Improvements in rock reamers, which invention is applicable to other purposes."

This invention consists in constructing a reamer for forming a cavity or cavities in a drilled hole without enlarging the mouth of the orifice to receive an explosive charge, or for enlarging the bore of any tube, or for forming one or more enlarged chambers therein at any part of the bore.

A.D. 1875, January 22.—No. 247.

BROCK, Charles Thomas, of Nunhead, in the county of Surrey, pyrotechnist.—"Improvements in "apparatus for displaying fireworks."

The features of novelty which constitute the invention are, the production of moving colored rays and shadow effects in the display of fireworks by means of a lamp containing several chambers and revolving on an axis. In each chamber is placed one or more pyrotechnic colored lights, and during combustion the lamp is caused to revolve and thereby cause the motion in a similar direction of the beams of colored light.

A.D. 1875, January 22.—No. 248.

JONES, Hugh, and **DAVIES**, John, both of Ruthin, in the county of Denbigh, North Wales.— "Improvements in apparatus or appliances for stoppering bottles containing aërated and other "liquids."

Making horizontal aperture in neck of bottle and fitting tap in same, with india rubber or other washer in socket below tap plug.

A.D. 1875, January 22.—No. 249.

ASPINWALL, Edward Olier, of Manchester Street, Manchester Square.—"Improvements in the "manufacture of wicks for candles and lamps and in the machinery employed therein."

A method is described of manufacturing wicks from paper twisted, plaited, or folded together. A machine is employed for the purpose of forming the wicks; it is provided with reels whereon the paper is wound, and from whence it is drawn off and manufactured into wicks of the required form.

A.D. 1875, January 22.—No. 250.

LANCASTER, William, of Accrington, in the county of Lancaster.—"Improvements in sizing and "dressing machines, parts of which improvements are also applicable to warping or beaming "machines, and to looms for weaving."

My invention relates, firstly, to the construction of the fans employed for creating a current of heated air for drying the yarn in sizing and dressing machines, and also in the construction of the cages or lath cylinders mentioned in the Specification of Letters Patent granted to me and Eugene Dollander, dated 4th May 1874, No. 1569.

Secondly, to an apparatus for boiling the size in the size box, and keeping it constantly in circulation, so as to keep its strength and thickness always uniform; and an arrangement for keeping the immersion roller in the size box constantly bearing against the first finishing roller; and thirdly, to an apparatus for stopping the action of the machine whenever any of the ends or threads may break; this part of my invention is also applicable to warping or beaming machines and to looms for weaving.

A.D. 1875, January 22.—No. 251.

VOSPER, Charles Walter, of Stoke Devonport, in the county of Devon, engineer, and ROGERS, George Porter, of Seaton Terrace, Plymouth, in the county of Devon, draper.—"Improvements in "sewing machines and sewing machine stands."

The features of novelty in this invention consists :—

First, in giving a parallel lateral motion to the needle bar, so as to do overseaming button holes, herring bone stitches, and similar work.

Second. The shuttle is made with two points and worked by a double groove cam fixed on the driving shaft of the machine, the cam being so constructed as to pause at either side, the shuttle remaining in one position meanwhile.

Third. The stand is so constructed that a bar will be placed across it in front of the operator, on which bar may be placed goods to be operated upon.

A.D. 1875, January 22.—No. 252.

WEARE, Robert, of the city of Manchester, mechanical engineer.—"Improvements in and apparatus "for preventing or extinguishing fire in ships, underground apartments, and other enclosures; part of "the apparatus being useful for other purposes."

The features of novelty in this invention consist in the method adopted for using dry carbonic acid gas for the purposes of extinguishing or preventing fire on board ship, or in apartments, or other enclosures; in the peculiar construction and arrangement of the generating chamber wherein the gas is manufactured, and of the receptacles for containing the materials from which the gas is to be made, and which construction of receptacle is also useful as a substitute for the gutta percha or glass carboys now used for storing and transporting acids and other chemicals, the joints of such chamber and receptacles being cemented together by marine glue or other cement, to render them impervious and unchangeable in any climate.

A.D. 1875, January 22.—No. 253.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Charles Gordon Imlay, of Philadelphia, Pennsylvania, United States of America.*)—"An improved apparatus for preventing fraud by the conductors of tram-"way cars and similar vehicles."

The object of this invention is to determine the number of fares collected by conductors of tramway or street cars and similar vehicles, and the nature of the said invention consists principally in the combination of an alarm box and an inclined tube or trough extending longitudinally through the street car for the admission of balls of certain size, which balls are to roll through the tube or trough into the alarm box and sound the bell therein for each fare collected by the conductor.

A.D. 1875, January 22.—No. 254.

STOKES, Robert, metal worker, and **GOFF**, Robert, manager, both of Bow, in the county of Middlesex.—" Improvements in the manufacture of busk and similar fastenings."

The object of this invention is to improve the manufacture of the stud fastening known as Thomson's unbreakable busk fastening and described in the Specification of a Patent bearing date.

A.D. 1875, January 22.—No. 255.

STOCKMAN, Benjamin Pryor, of 3, Poets Corner, in the city of Westminster, civil engineer.—" Improvements in electric signalling apparatus."

This Specification describes a construction of "commutating key" for sending two or more currents through the line each time the key is depressed, and also a receiving instrument in which a loop or single line of gold, platinum, or other non-magnetic metal is used.

A.D. 1875, January 22.—No. 256.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Jean Eyquem, of Paris, France.*)—" Improvements in the manufacture of steel."

The invention consists in the use for cementing iron on a large scale of ammoniacal and carburetted hydrogen gases acting simultaneously and produced by the decomposition of a mixture of sal ammoniac and a substance such as peat, tan, and other substances or liquids furnishing proto or bicarburetted hydrogen.

It also consists in the manufacture by the above means of cast steel from scrap iron, ores, refining slag, and other products.

A.D. 1875, January 22.—No. 257.

LEACH, Robert, of 12, Rosamond Street, Hulme, Manchester, machinist, and **WEBB**, John, of 112, Grosvenor Street, Chorlton on Medlock, Manchester, manufacturer.—" Improvements in embroidering machines."

The improvements consist of a new arrangement of certain parts of the "bonaz" embroidery machine, namely, the needle looper, in relation to the "feed motion" or the "feed motion" in relation to the needle and looper, whereby a raised or pile stitch is produced, instead of the chain stitch resulting from the present arrangement. The improved arrangement of these parts is effected by turning the hook of the needle, and the slot of the looper around their respective centres, a distance of 180 degrees, or thereabouts, so that they will take a position about opposite to that which they have in the ordinary arrangement of the "bonaz" machine, considered relatively to the feed motion thereof. Or by altering the position of the feed motion considered relatively to the needle and looper, to a corresponding extent. By which means an imitation of hand embroidery may be produced.

A.D. 1875, January 23.—No. 258.

BROWN, James Fleming, and **BAIRD**, James, both of Glasgow, in the county of Lanark, North Britain.—" Improvements in weaving figured fabrics, and in the machinery employed therefor."

The features of novelty which constitute this invention are the arrangements of mechanism for actuating the cards tied to the harness cords or to the mails.

A.D. 1875, January 23.—No. 259.

MAYER, Henry Charles, of Pall Mall, in the county of Middlesex, surgeon.—" Improvements in the spirometer."

This is an instrument in which the user blows through an air tube connected to a vessel of known capacity, and in doing so increases the pressure of the air inside the vessel, and the additional pressure acting on mercury in a mercurial tube connected to the vessel forces the mercury up the tube. The said tube is graduated to show the additional pressure, and also the amount blown into the vessel, so that the same will at once be seen by noting the height of mercury, the additional pressure, and also the amount of air blown into the vessel. A small pump can be provided to prove correctness. Correction for increased temperature can be made as required.

A.D. 1875, January 23.—No. 260.

LEES, Thomas, and **PIDGEON,** John, both of Stockport, in the county of Chester.—"Improvements "in apparatus for curling the brims of hats."

This invention relates to an apparatus for curling or bending over the sides or edges of the brims of felt or silk hats previously to shaping the same, and consists principally of a table and block to receive the hat, and a shaper and grooving plate for breaking over or curling the edge of the brim, and a heater or "dummy iron" for pressing the same.

A.D. 1875, January 23.—No. 261.

COLEBROOK, Cemer Thomas, of Islington, in the county of Middlesex, engineer.—"Improved means "or apparatus for raising water from wells or other places, or for raising other liquids."

To carry my invention into effect I employ any suitable number of chambers or compartments which I place at suitable distances apart. These chambers are attached to a main pipe which leads to the liquid to be raised, and in each of these chambers I arrange a retaining valve so as to allow the liquid to rise but prevent it from returning and leading from each of the chambers. I also arrange and connect an air pipe, which pipes I connect alternately to one or the other of two main air pipes leading to or from an apparatus capable of producing alternately a partial vacuum and a pressure. If, for example, we suppose say six chambers to be used, then upon producing a partial vacuum, the chambers Nos. 1, 3 and 5 are affected thereby, and the liquid will rise, firstly, into chamber No. 1 and then upon producing the pressure the air that was drawn out from Nos. 1, 3 and 5 is pressed back to them again and at the same time a partial vacuum is being formed in Nos. 2, 4 and 6, and the liquid will not rise into chamber No. 2 and by similar repetition the liquid will continually rise into the next higher compartments until it reaches the top whence it may be conducted as required.

A.D. 1875, January 23.—No. 262.

AYLESBURY, Hector, of the city and county of Gloucester.—"Improvements in stoppers for bottles "for containing aërated and other liquids."

This consists of a disc fixed to rod, and of another disc through which rod passes. The gas in bottle forces fixed disc against root of neck of bottle; movable disc fills bottle neck and keeps out dirt.

A.D. 1875, January 23.—No. 263.

MANNING, Richard Hellyer, of 3, Saint George's Road, Marylebone, in the county of Middlesex.— "An improved plane iron."

This invention relates to what are known as plane irons, wherein the improvement on the present system is derived by the screwing together of plates of iron or steel with a very thin plate of steel placed between the outer plates.

In carrying out my invention the bed iron is constructed with a hole or long slot in or about the centre of it, so as to allow sufficient room for a screw to pass freely through the head of the screw to bed on the underneath side of the bed iron.

A.D. 1875, January 23.—No. 264.

ALLIBON, George, **MANBRÉ,** Alexandre, and **BELDAM,** William Asplan, all of No. 19, Salisbury Street, Strand, London, and 3, York Buildings, Dale Street, Liverpool, engineers.—"Improvements "in steam boilers or steam generators."

The combination of boilers, each containing a furnace (or furnaces) and entirely filled with water, with tubular steam-generators and a steam receiver (or receivers) suitably mounted at different levels, and connected together by means of wrought iron pipes of large dimensions; and, when applied on board a ship (with the furnaces either fore and aft or athwart ship), the boilers and tubular vessels are arranged (in every case) back to back and connected together by means of horizontal pipes, to insure a perfectly free circulation of the water.

The combustion chamber at the end of each vertical arrangement of steam generators is formed by a cross wall and inclosure, cased in, so that the space between the two sets of steam generators is divided; and the water circulation pipes may cross them or pass through them horizontally; the flame and heated products of combustion pass from the back of each furnace, up the combustion chamber into the back ends of the tubes, and along them to the smoke box, and from thence to the uptake and the root of the funnel.

The horizontal steam receiver is connected by vertical pipes with and to the boiler or boilers containing the furnaces, and with and to the tubular steam generators, and the up-takes may be brought together over the steam reservoir; and, where a nest of four sets of boilers is formed, the four uptakes may be brought together and continued and brought to the root of a single funnel, or two separate funnels may be employed.

A.D. 1875, January 23.—No. 265.

MILLS, Edgar Coniston, of Gorton, in the county of Lancaster, engineer, and **HALEY, Henry**, of the same place, engineer.—"Improvements applicable to motive power engines worked by the "explosion of gas."

This invention consists in providing an elastic cushion to transmit the force of the explosion.

A.D. 1875, January 23.—No. 266.

FRIEDLÄNDER, Joseph, of the firm of Friedländer and Frank, of Vienna, in the Empire of Austria, agricultural engineers.—(*Partly a communication from Casimir Jachimovicz, of Jaroschenka, in the Empire of Russia.*)—"Improvements in apparatus for collecting grain-straws and other similar crops, " and for binding the same into bundles or trusses."

This consists of a tilting machine with fingers at the front for under running the straws and placing them upon an endless belt provided with prongs which deposit the straws into a reservoir, where they fall upon arms which at a given time lift the bundle over into a cradle containing other arms, for compressing the bundle; the ends of a straw or other band are then lifted and inserted into a twisting apparatus which forms the tie knot automatically. The first arms then return and the cradle turns over and deposits the bundle on to the ground.

A.D. 1875, January 23.—No. 267.

NEWBOLD, Edward, of the town and county of the town of Nottingham.—"Improvements in furnace "bars."

The said improvements consist in forming a furnace bar of a number of separate pieces or sections. Each end of the said sections is bevilled, and has a groove or channel formed in it. The said sections are supported by a suitable framework, and when placed in position slightly overlap each other.

A.D. 1875, January 23.—No. 268.

GILL, David, of the town of Weston super Mare, in the county of Somerset.—"An improved method " for neutralizing the poisonous and offensive nature of sewer or drain gas, and to deodorize the " sewage."

This invention consists of a vessel made of fireclay or other suitable material for generating the desired gas or vapour for fumigation, with heating chamber under; an inlet pipe to admit air to drive fumes from the generating vessel forward into drain; an exit pipe from the said vessel for conveying fumes into drain; and a pipe or upshaft placed at the most suitable position to the drain, carried up to a suitable height; this shaft is to create a current to draw the fumes down into the drain and through it. This invention can be used to flush drains with fresh air without fumes. The principle of this invention is also applicable on a larger scale to public drainage, and may be extended over large areas by means of stations. The compound for chlorine gas has been found suitable, but other fumous disinfectants may be used by this method.

A.D. 1875, January 23.—No. 269.

ALLEN, William, of Manchester, in the conuty of Lancaster, engineer.—"Improvements in ma- " chinery for raising and forcing fluids and liquids."

The pump consists of a plunger which works in a cylinder, the upper part of which is closed by a gland with a double seating. The ingress and egress valves are connected by side passages to the upper and lower ends of the cylinder, and the upper passage passes through the gland between the two seatings. The hole in the gland must be wider than the passage to allow for thê tightening up of the gland.

A.D. 1875, January 23.—No. 270.

McEVOY, Charles Ambrose, of 4, Piccadilly, in the county of Middlesex.—"Improvements in apparatus for extinguishing fire."

This Provisional Specification describes a "fire annihilator," *i.e.* a strong vessel nearly filled with water which when required for use is placed under pressure by generating gas (say carbonic acid gas) inside it.

The chemicals for generating the gas are not allowed to come into contact with the water.

A.D. 1875, January 23.—No. 271.

SAVAGE, William Peacock, of Wood Hall, Hilgay, Downham, in the county of Norfolk.—"Improvements in apparatus for preventing accidents on railways."

This Provisional Specification describes :—

1. Supporting the joint between the rails to prevent them being deflected,

2. Employing a rope running from end to end of the train to enable the engine driver or guard to apply the breaks simultaneously throughout the train.

3. Mounting a large bell on each carriage which rings of itself when the carriage is off the line and can be rung by the passengers to attract the attention of the driver,

4. Strengthening the tyres by employing in addition to the present flange a second flange on the other side and internal in place of external.

A.D. 1875, January 23.—No. 272.

POTTS, Joseph Charles, of Handsworth, in the county of Stafford, manufacturer, and DARNELL, Daniel Charles West, of Cargilfield, Trinity, Edinburgh, Clerk in Holy Orders.—"Improvements in apparatus for ventilating water closets, lavatories, bath rooms, sinks, and other structures and appliances connected with sewers."

The object of this invention is to ventilate water-closets and other structures in such a manner that sewer gas is excluded therefrom, and the sewer gas delivered into the atmosphere at a point where it cannot gain access to the building, and any exhaustion or diminution of pressure in the closet soil pipe or other pipe communicating with the external drain made to result in a current of fresh air from the atmosphere passing into the building.

The soil pipe of the water-closet, sink, or bath opens into a funnel shaped chamber, the top of which is open and is on or above the level of the ground. The bottom of this chamber terminates in an ordinary water trap. Near the part of the soil pipe fixed into the sewer is a vertical pipe or air shaft rising to the top of the building. Should the equilibrium of the air within and without the building be destroyed from any cause so as to induce a current into the house, the equilibrium is restored not by gas from the sewer, but by a current of atmospheric air passing through a grating at the top of the air chamber into which the soil pipe opens. If from pressure of wind or otherwise there is a tendency to a gaseous current from the sewer towards the house, the gas driven from the sewer escapes by the vertical pipe or air shaft, and is delivered into the atmosphere.

A.D. 1875, January 23.—No. 273.

REDMAN, Thomas Barnes, of East Greenwich, and SIGGERY, Edmund Craft, of Plumstead, both in the county of Kent.—"Improvements in couplings for railway engines and carriages."

This invention consists of a self acting coupling composed of a flat plate of sufficient strength to support the end of the carriage in the event of a wheel or axle giving way, said plate being received between the plates of a traction bar, and locked therewith by bolts on which the couplings pivot dropping through holes made in the several plates on the carriages being coupled up.

A.D. 1875, January 23.—No. 274.

KERBY, John, of the Haymarket, in the county of Middlesex, military boot and spur maker.—"Improvements in boots for military, sporting, and other purposes."

This invention has for its object the combination of the lace boot, legging, and gaiter, and the making of the boot waterproof to the top (and not as the legging and boot detached), and as the flap comes to the top of the boot, and the spat entirely covers the lacing, the instep and leg can be made large or small as desired. It has the advantages of the lace boot and the appearance of the boot and legging for riding. It is also suitable for troops, as it can be made to open to any size so as to be put on or off with the greatest ease and dispatch.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 17 to July 23, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, January 25.—No. 275.

BURRELL, Percy, and VALPY, Henry, both of 5, Victoria Street, in the city of Westminster, civil engineers.—"An improved railway sleeping carriage and an improved tyre in connection therewith."

A method by which part of the sleeping berth apportioned to one passenger in a railway carriage is placed under or by the side of the space allotted to another passenger, longitudinally, so as to effect a saving in the length of the carriage, and to avoid the danger of one passenger being placed over another in the same compartment. Each berth may be shut off by a door, partly for the sake of enabling the passenger to use special sanitary conveniences. The sleeping berths may be readily converted by passengers into seats.

Also an improved method of securing the tyres of the carriage wheels, by means of a double rebate and circumferential key, so that in case of fracture, no part of the tyre can be separated from the wheel.

A.D. 1875, January 26.—No. 299.

WALTON, Thomas, of Birmingham, in the county of Warwick, lock manufacturer.—"Improvements "in locks."

According to this invention the stump of lever locks instead of being carried by the bolt is carried by an oscillating plate, acted upon by the key; and the bolt is worked from the said oscillating plate by an arm engaging with a forked strap of the bolt. The key first lifts the levers, and afterwards gives motion to the oscillating plate, which plate by its motion shoots or withdraws the bolt, and carries the stump on it from one set of gatings in the levers to the other set. This mechanism is specially applicable to double handed lever locks, the lock plate of the said locks having a double key hole in the same line, into one or other of which key holes the key is introduced, according as the lock is used with a right or with a left handed door or article.

The tongues of buckle locks are jointed, either to the side of the lock case or to the end bar of the buckle frame. In the former case the tongue is fastened down by the lock bolt passing under the heel of the tongue, and in the latter case by the lock bolt passing over the point end of the tongue.

A.D. 1875, January 27.—No. 306.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Emile Cornely, of Paris, France.*)—"Improvements in edging "machines."

The object of this invention is a machine for making the edging on articles scolloped on their borders, such as curtains, ladies wearing apparel, table covers, etc., etc., and where ordinary binding is not employed; the edging made by the machine being sufficiently strong to permit the material to be cut out, and being at the same time an ornamental stitch, as is required on the goods above mentioned.

To effect this, two needles or needle hooks are employed, which are either fixed in one and the same needle bar, or in two parallel needle-bars set close together, and which stitch a ribbon on to the material to be edged, so that the needles or hooks will stitch into the edges of the ribbon, and sew the same to the material by means of two rows of chain stitches which appear on the face of the ribbon.

But to imitate fully the Swiss edging, a special ribbon is used, this ribbon being woven in such a manner that the woof only shall be plainly visible on its face, it being made of of thick thread, while the warp, consisting of thin threads, shall be visible, but very faintly on the face of the edging, and the edging thus made will have the appearance of two parallel chain stitches interlaced by thick transversal threads resembling in appearance the Swiss edging made on curtains.

To guide the ribbon so that the needle hooks will always stitch into its edges, it is conducted by means of a guide which works in combination with the universal feed motion of an embroidering machine, such as the "Bonnaz" embroidering machine, and which will present the ribbon to the needles in following all the sinuosities of the borders to be edged.

A.D. 1875, January 28.—No. 322.

HOWARTH, William, and **HOWARTH**, Ambrose, both of Bradford, in the county of York, dentists.—"Improvements in lathes for dental and other purposes."

The headstock of our improved lathe consists of a spindle with a toothed wheel at each end; these pinions gear into other pinions fixed on short axles, each set being supported in a box with a face plate; these short axles have taper sockets in which the different tools are fixed, and the articles of dentistry or other articles to be operated upon are presented to the different tools in succession.

The details may be modified.

A.D. 1875, January 28.—No. 338.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Charles Edwin Robinson, of the city, county, and state of New York, United States of America.*)—" Improved apparatus for feeding and burning crude oils and other liquid hydrocarbons " in furnaces."

The invention consists 1st in improved apparatus for feeding the oil to the burner by direct pressure of the steam, and 2ndly in the burner by which the steam and oil are admixed in relative proportions and spread out in contact with atmospheric air and burned within the furnace.

A.D. 1875, January 29.—No. 340.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from David Robert Brownlow, and George Weedne Francis, both of Middletown, Connecticut, United States of America.*)—" An improved coating for iron and other " metals."

This invention relates to an adhering coating for iron and other metals, composed of the ordinary slag from an iron furnace, or its equivalent, and borax, or other equivalent flux, by means of which the metal is perfectly protected from the action of the air or of moisture, and so that the metal can be subjected to a high degree of heat without injury to itself or the said coating.

A.D. 1875, February 6.—No. 449.

TYER, Edward, of No. 4, Old Street, Finsbury, in the county of Middlesex.—"Improvements in " galvanic batteries."

This invention relates to cells of galvanic batteries, a single cell being a jar or vessel with grooves or lugs in its interior or notches in its sides, into which is slid a perforated slab of non-conducting material to separate the two elements, and compound cells being formed in a box divided by permanent partitions into a number of cells, into each of which is slid a like perforated slab. In some cases the slab is clothed with paper or porous fabric. The chief object of the invention is simplicity of construction in a form which gives facility for cleansing all parts.

A.D. 1875, March 18.—No. 1003.

VAUGHAN, Edward Primerose Howard, F.C.S., of 67, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Jules Auguste Maynard, residing at Paris, in the Republic of France.*)—" Improvements in the mode of applying oil painting to wood, plaster, and other surfaces, " and in the materials connected therewith."

This invention relates to an improved process, by means of which a pellicle of oil paint temporarily laid on a sheet of prepared paper may, when set, be applied to walls, pannels, roofs, and other surfaces, and subsequently uncovered by the removal of the transfer paper, previously moistened.

A.D. 1875, July 17.—No. 2565.

POWLESON, William Lee, of San Francisco, in the state of California, United States of America.—" Improvement in steam superheaters."

I constructed my superheater with an outside case, with division partitions, an intromitted supply and tempering or equalizing pipe, and a discharge pipe for superheated steam. The steam passing in is conveyed through the whole of the steam chamber around the partitions B and C, and back through the lower part of the partitions to the first division, where it is discharged into the chamber and again passes around the partitions until it reaches the discharge pipe leading to the boiler furnace.

A.D. 1875, July 21.—No. 2593.

ANKERS, John, of Shire Oaks, in the county of Nottingham.—" Improved means and apparatus for " lubricating the bearings of the axles of waggons known and distinguished by colliers and miners as " 'corves.' "

The feature of novelty of this invention consists in rendering the operation of lubricating self-acting by means of apparatus constructed and arranged in the following manner:—

Between the line of rails on which the wheels of the corve rotate are placed a series of troughs or boxes to contain grease. These boxes are arranged side by side in pairs; a revolving star wheel is mounted on an axle in each box, and at one side of the line of rails opposite to each pair of grease boxes there is a fixed arrangement for pushing the body of the waggon a short distance along the bearing part of the axles, so as to lubricate the axles at opposite sides of the bearings thereof alternately, the pushing mechanism being so fixed as to push the body of each waggon sideways in the following order:—At the first pair of grease boxes the waggon is pushed to the right, at the second pair of boxes to the left, and so on alternately, the effect being to cause the aforesaid revolving wheels to lubricate each side of each bearing alternately by the action of the axle, which coming into contact with the teeth of the star wheels causes them to rotate and carry up and deposit on the axle the lubricating matter.

A.D. 1875, July 23.—No. 2621.

GILL, David, of the town of Weston super Mare, in the county of Somerset.—" Improved methods " and apparatus for neutralizing and deodorizing the poisonous and noxious gases emitted from sewers " and drains, and also the sewage matters contained therein."

This invention consists in certain methods of neutralizing the poisonous, noxious, and offensive qualities of sewer or drain gas, and also of neutralizing the injurious qualities of sewage matters, and of deodoriing the same; and in the construction and arrangement of apparatus for effecting such purposes, the whole forming a system of fumigation. For these purposes any chemical compound capable of readily evolving chlorine gas, or any other compounds belonging to the class of substances known as " disinfectants " is or are employed, the gases or vapours being produced therefrom, and brought into contact with the substances to be neutralized and deodorized by means of the apparatus, which is specially constructed and arranged to effect such objects.

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 32 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 4 with the weekly Nos. of the Index for the present year.]

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Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas, parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from [fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Clark, A. M. (*Portait & Weber*), 28, Jan. 2, Preparing [fibres for spinning.
—— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of [light and heat.
—— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
—— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting [hats, &c.
—— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial [apparatus.
—— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for [nut blanks.
—— A. M. (*Eyquem*), 256, Jan. 22, Steel.
—— A. M. (*Robinson*), 338, Jan. 28 (*App.* 4.) Feeding and burning oils in furnaces.
—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.
—— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery [and handles.
—— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking [screw nuts.
—— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.* [46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway [for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electromagnetic engines.
—— A. M. (*Lodge*), 2520, July 13 (*App.* 3.), Fulling [mills.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— W., 80, Jan. 9, Railway breaks.
Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8, [Bricks, tiles, &c.
Cleveland Paper Box Machine Co. (Haseltine), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
Clough, W. R. (Haseltine), 1640, May 3 (*App.* 45.) Corkscrews.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and [windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers [and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Cornely, E. (Gedge), 306, Jan. 27 (*App.* 4.) Edging [machines.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cramp, A. H., 225, Jan. 22, Stretching boots and shoes.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-menageries.
Crocker, S. L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.

Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
——— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
——— (Bousfield), 2084, June 5 (*App.* 50.) Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti-
[lating water-closets, &c.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.)
[Sewing machines.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and
[stuffing box.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8,
[Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677,
[May 5 (*App.* 45.) Paddle wheels.
Edwards, E. (*Boullenot*), 75, Jan. 8, Safety lamps.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
——— W. & J., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9
[(*App.* 33.) Filling and corking bottles.
Fewster, W., 293, Jan. 26 (*App.* 1.) Saving life and
[property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air
[engines, &c.
Fitz, E. E., 187, Jan. 18, Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flagler, H. K. (Hunt), 290, Jan. 26 (*App.* 2.) Welding
[tubes, &c.
Fliteroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing-
[machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
Foundries & Forges Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
France, W. H., 104, Jan. 12, Combing wool, &c.
Francis, G. W., & Brownlow, D. R. (Lake), 340, Jan. 29
[(*App.* 4.) Coating for metals.
Friedlander, J., & *Jachimovicq, C.*, 266, Jan. 23, Collect-
[ing crops.
Furrell, E. W. (*Browne*), 241, Jan. 21, Stand for charts, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele-
[graphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for
[wood, &c.
——— M., 173, Jan. 16, Railway wheels.
Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots
[and shoes.
Garland, H. P., 229, Jan. 21, Sewing-machines.
——— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish-
[ing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
——— W. E. (*Cornely*), 306, Jan. 27 (*App.* 4.) Edging
[machines.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.
Gill, D., 268, Jan. 23, Deodorising sewer gases.
——— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer
[gases.
Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling,
[&c. beer.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
——— W. & G., 179, Jan. 16, Railway signalling.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
——— W., 129, Jan. 13, Soaps.

Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2, [Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Hamburg-American Sewing-Machine Co. (Jensen), 26, [Jan. 2, Printing metals.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250, [June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3 (*App.* 51.) Indicating [speed of ships.
——— J., 147, Jan. 14, Sulphates.
Harrison, S. L., 461, Feb. 6 (*App.* 33.) Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.* [36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4 (*App.* 32.) Balanced [slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.* 33.) [Filling and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.* [33.) Rock drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.) [Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009, [Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App* 40.) Burning [bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting [match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device [for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.) [Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread [spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening [cotton.
Hayward, G., Knap, C., & Taunton, R. H., 209, Jan. 19, [Wrought iron tubes.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10 (*App.* 33.) Horse-shoe & other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Higginson, A., 108, Jan. 12, Motive-power engines and [pumps.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13, [Cartridges.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers [and other boilers.
Holland, W., & *Myers, H.*, 34, Jan. 4, Umbrellas and [parasols.
Holmes, R. R., 122, Jan. 13, Aërated liquors.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.) [Steam-boilers.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other [articles.
Howarth, A. & W., 322, Jan. 28 (*App.* 4.) Dental lathes, [&c.
——— J., 240, Jan. 21, Hot-air stoves.
——— W. & A., 322, Jan. 28 (*App.* 4.) Dental lathes, [&c.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop-[pering bottles, &c.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
——— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19, [Bale bands.
Hunt, B. (*Flagler*), 290, Jan. 26 (*App.* 2.) Welding [tubes, &c.
——— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-[magnetic engines.

I.

Imlay, C. G. (Lake), 253, Jan. 22, Preventing frand by [tram-car conductors, &c.
Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.
Ingram, J. G., 235, Jan. 21, Washers and packing pieces.

J.

Jachimovicz, C., & Friedlander, J., 266, Jan. 23, Collect-[ing crops.
James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*) [26, Jan. 2, Printing metals.
——— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
Jeyes, J., & Turner, C. H., 205, Jan. 19, Lubricator.
Johnson, G. (Clark), 199, Jan. 19, Rolling bars for nut [blanks.
Johnson, J. C., 209, Jan. 20, Forming tube skelps.
——— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening [drills.
——— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer-[ing, &c.
——— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing [fires.
——— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans-[mitting musical vibrations, &c.
——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
——— *J. R., & Harding, G. P.* (Morgan-Brown) [2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, S., & Allen, W., 191, Jan. 18, Heating feed [water; condensing steam.
——— S. H., 156, Jan. 14, Cocks or valves.
Joliot, J. P. S., 204, Jan. 19, Railway breaks.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
——— H., & Davies, J., 248, Jan. 22, Stoppering bottles.
——— H. L., 492, Feb. 10 (*App.* 3.) Disinfectants and [deodorizers.
——— R. A., & Perry, J. J., 12, Jan, 1, Lighting cigars, &c.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.
Kendrick, T., 31 Jan, 4, Coffin furniture.
Kennedy, W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23, Boots.
Kidd, J., & *Arnold, L.*, 66, Jan. 7, Gas.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening
[cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19,
[Wrought iron tubes.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.
Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 18,
[Treating and dyeing vegetable textiles.
Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 18.
[Treating and dyeing vegetable textiles.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
——— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
——— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
——— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
——— W. R. (*Whittemore*), 163, Jan. 15, Spikes.
——— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.
——— W. R. (*McClintock*), 207, Jan. 19, Preserving
[substances.
——— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by
[tram-car conductors.
——— W. R. (*Brownlow & Francis*), 340, Jan, 29 (*App.*
[4.) Coating for metals.
——— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
——— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-
[menageries.
——— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting
[ores; making iron; furnaces.
——— W. R. (*McClintock*), 2080, June 5 (*App.* 50.)
[Compositions for paving, &c.
——— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather
[pulp.
——— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing
[electrotype shells.
——— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
——— W. R. (*Bannister & Milligan*), 2245, June 18
[(*App.* 51.) Device for advertising.
Lancaster, W., 250, Jan. 22, Sizing and dressing ma-
[chines, &c.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14,
[Punching and rivetting machines, &c.
Lee J., 131, Jan. 13, Fire-arms.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Leiter, J. (Wirth), 296, Jan. 26 (*App.* 2.) Electric
[apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181,
[Jan. 16, Phosphates and phosphorus.
——— H., Box, J., Aubertin, E., & Boblique, L., 214,
[Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway
[sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, G. H., 137, Jan. 13, Cigars.
——— R. T., 237, Jan. 21, Looking glasses and mirrors.
Lloyd, J., & Scully, J., 226, Jan. 20, Drying wall
[papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c.,
[threads; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing
[slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and
[axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.)
[Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving
[substances.
——— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Com-
[positions for paving, &c.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c.
[waste products.
——— M., 200, Jan. 19, Compounds for dissolving
[resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing
[instruments.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M.,
[76, Jan. 8, Railway wheels and axles.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
——— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing
[stones, &c.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 18,
[Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscrip-
[tions, &c.
Manbré, A., Beldam, W. A., & Allibon, G., 264, Jan. 23,
[Steam-boilers.
Manning, R. H., 263, Jan. 23, Plane irons.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, J., 162, Jan. 15, Thrashing machines.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.*
[44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls.

Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
—— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.*
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped
[axles.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8
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—— H. Y. D., 135, Jan. 13, Purifying gas.
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Sellars, J. C., 112, Jan. 12, Cement.
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—— *V.* (Thayer), 2513, July 13 (*App.* 3.) Compound [for dental plates, &c.
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4. Index of Subject-matter to Chronological and Descriptive Index from January 1 to January 23, 1875, and to Appendixes from January 24 to July 23, 1875.

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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 24 to January 30, 1875.

A.D. 1875, January 25.—No. 275.

BURRELL, PERCY, and **VALPY**, HENRY, both of 5, Victoria Street, in the city of Westminster, civil engineers.—"An improved railway sleeping carriage, and an improved tyre in connection therewith."

A method by which part of the sleeping berth apportioned to one passenger in a railway carriage is placed under or by the side of the space allotted to another passenger, longitudinally, so as to effect a saving in the length of the carriage, and to avoid the danger of one passenger being placed over another in the same compartment. Each berth may be shut off by a door, partly for the sake of enabling the passenger to use special sanitary conveniences. The sleeping berths may be readily converted by passengers into seats.

Also an improved method of securing the tyres of the carriage wheels, by means of a double rebate and circumferential key, so that in case of fracture, no part of the tyre can be separated from the wheel.

A.D. 1875, January 25.—No. 276.

VARLEY, FREDERICK HENRY, of Mildmay Park Works, Highbury, in the county of Middlesex, engineer.—"An improved coupling for securing together portions of screw propeller and other shafting requiring to be driven in a continuous length."

"The mode of drawing the segments or portions of the coupling together by wedges and the use of steel jaws in the coupling to cut key ways or indented recesses in the shaft whilst the segments are being drawn together."

A.D. 1875, January, 25.—No. 277.

HOWARD, JOHN, and **COX**, WILLIAM, both of the 7th Dragoon Guards, of Cahir, Ireland.—"A new or improved saddle-girth tightener."

The object of this invention is to keep the girths of a saddle at all times tight to the horse's or animal's belly.

To one end of the girth I attach a suitable buckle, and to the other end thereof I attach a strap (to fasten in the buckle as usual) and also one of the improved "tighteners."

The "tightener" consists of a small flat or curved metallic box enclosing two, three, or more longitudinal metal rods encircled by helical springs applied so as to have a constant tendency to draw the strap inwards or towards the box so as to tighten the girth when upon the horse.

A.D. 1875, January, 25.—No. 278.

BLAIN, JAMES, of Manchester, in the county of Lancaster, commercial traveller.—"An improved automatic fire extinguisher."

I place the ordinary ingredients for generating "carbonic acid gas" in two or more receptacles on a convenient platform or fixture in the portion of the building to be protected from fire. The contents of these receptacles are caused to unite as soon as a fire occurs by a continuous cord which when burnt by the fire allows one receptacle to come in contact with the other and breaks a division between the two.

A.D. 1875, January, 25.—No. 279.

TANNER, BENJAMIN, F.C.S., of Dublin, Ireland.—"Improvements in the treatment of ores and minerals for the purpose of obtaining useful products therefrom."

This invention consists in the treatment of ores and minerals which contain zinc, lead, copper, silver, gold, iron, and sulphur, and of which the "bluestone" found in the Isle of Anglesea may be taken as an example. The chief advantage obtained is the separation of the zinc and lead from the ore or mineral. The ore or mineral is first reduced to a state of fine division, and treated with hydrochloric or sulphuric acid, or with other chlorides or sulphates capable of bringing the zinc and lead into a soluble condition. The solution is then submitted to a series of decompositions and precipitations for the separation of the metals contained therein.

A.D. 1875, January 25.—No. 280.

BADCOCK, James, of the firm of James Badcock and Son, of Westmoreland Buildings, Aldersgate Street, in the city of London, wholesale manufacturers.—"An improved manufacture of bustle o "ladies' dress improver."

This consists in composing a bustle or dress improver of wire in which the joints are formed by helical coils.

A.D. 1875, January 25.—No. 281.

MAQUET, Henry Joseph, architect, of Brussels, in the Kingdom of Belgium.—"Improvements in "the construction of hand-or-guard-railings as applicable to railway trains."

A hand railing is firmly attached either to one of the steps or to the irons which support the same, and the end of the railing of one carriage is connected by chains, or leather or india-rubber bands, or other flexible contrivances to the end of the railing of the next carriage, for which purpose the chains or other analogous devices are provided with hooks which will admit of their continuity being broken when required.

A.D. 1875, January 25.—No. 282.

FOXWELL, Daniel, of the city of Manchester, in the county of Lancaster, card manufacturer.—"An "improved mode or method of flattening or shaping wire, and in the machinery or apparatus used "therefor."

The object of this invention is to obtain flat or other shaped metal wire of greater strength in proportion to its transverse section or area than can be obtained by the present mode of manufacture, the wire being principally intended to be used in the making of wire cards for carding engines, although it may be usefully employed for other purposes where it is desirable to obtain the maximum strength in the minimum space.

Ordinary round drawn wire is taken and caused to be subjected to a continuous hammering as it passes from one drum through suitable guides or tension drags made of two pieces of metal or other substace, the inner surfaces of which are covered with leather or other suitable materials, to the taking up drum or roller which is driven by power in the ordinary way.

The hammer is actuated by tappets, cams, or springs, or in any desired manner, and if other shapes are required to be hammered all that is necessary is to form recesses in the hammers and anvils of the shape required.

A.D. 1875, January 25.—No. 283.

TOPP, Nathaniel, TOPP, Alfred, and NICHOLSON, Eugene, of Farnworth, in the county of Lancaster.—"Improvements in carding engines."

This invention consists in an improved self acting stopping motion for stopping the revolving motion of the doffer and also the feed rollers when a sliver breaks between the callender rollers and the ordinary coiler, there being a spoon or detector supported by the sliver when there is no breakage, but when the sliver breaks the spoon falls and gives motion by means of levers and rods to a bar which releases the ordinary stopping apparatus worked at present by hand and thereby stops the motion of the doffer and feed rollers.

A.D. 1875, January 25.—No. 284.

JAMES, John, of Halifax, in the county of York.—"Improvements in or applicable to railway "carriages and waggons."

This has for object providing bearings for railway carriages and waggons in the event of an axle or wheel breaking in order to prevent the train leaving the line.

A.D. 1875, January 25.—No. 285.

HAGGAS, William, of Burnley, in the county of Lancaster, mechanic.—"Improvements in crank "shafts of looms for weaving, and in machinery for turning the crank journals or necks of such "shafts."

This relates, firstly, to improved machinery or apparatus to be employed for securing in proper position for being turned the journals or necks of the cranks for the reception of the caps of the crank arms.

Secondly. In the application of a centre balancing apparatus applied to the crank shaft of looms.

A.D. 1875, January 25.—No. 286.

CORY, Edward, of Cardiff, in the county of Glamorgan, civil engineer.—"Improvements in motive "power engines, also applicable to pumps or measures for air, gases, or liquids."

This invention mainly consists of two or more revolving pistons working in a casing or cylinder and actuated by eccentric wheels or gearing which at certain parts of the revolution and while passing the steam inlet or port cause the area of the relative leading piston upon which the steam acts, to travel faster than the area of the piston immediately following upon which the steam presses with equal force. The steam thus acts upon the area of the relative leading and following pistons with equal pressure and by the difference of leverage from the eccentric gearing the pistons are compeled to revolve in continuous rotation. A reverse action takes place upon the area of the pistons while passing the exhaust port or steam outlet. The same invention can be applied as a water power engine and if driven from the exterior will act as a pump or exhauster for air gases or liquids and with the addition of an index to register the number of revolutions: it may also be applied as a meter or measurer of gases or liquids.

A.D. 1875, January 25.—No. 287.

COOMBE, James Cane, of Barnsbury, in the county of Middlesex.—"Improvements in the manu"facture of blacking."

The inventor takes a certain quantity of the ordinary starch; and dissolves same in hot or boiling water as is usually done; and whilst hot introduces, into the starch, oil, wax, or any suitable greasy matter; and stirs the mixture, and same is allowed to cool. When the mixture is cold, a small quantity of iodine dissolved in spirits of wine is added: and the result of the addition of the iodine is that the mixture is converted into a bluish black color.

To a gallon (more or less) of the above mixture is added about eight ounces (more or less) of a solution of per chloride or other per salts of iron and also a small quantity of gallic or tannic acids singly or mixed; and, following this, about two drachms of oil of cloves with eight ounces of glycerine (more or less) is added and thoroughly stirred. In making superior blacking suitable carbon blacks are added.

A.D. 1875, January 25.—No. 288.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Henri Nicolas Rogé, Edward Poret Pierre Hypolite Baffoy, and Pierre Stanislas Eléonore Dupré, all of Paris, France.*)—Improvements in treating canvas and other woven fabrics to "preserve the same from atmospheric and other destructive influences or causes."

The invention consists in the use for the above purpose of salts of lead and all products derived from lead, fixed in any known manner.

A.D. 1875, January 25.—No. 289.

SIMMONS, Joseph, of No. 38, Regent Street, London, W., and **MORRIS**, Joseph Matthew, of No. 6, Hanover Street, London, W.—"Improvements in purifying gas for inflating and rendering ascensive "balloons and other aërial machines, and in the apparatus employed therein."

An improved method of purifying hydrogen gas by filtering it through a mixture of lime and water is described. Also an improved construction of apparatus combining within itself a purifier and gasometer. Also an improved means of emptying the retorts when necessary.

A.D. 1875, January 26.—No. 290.

HUNT, Bristow, of Serle Street, Lincoln's Inn, in the county of Middlesex, gentleman.—(*A communication from Harvey Klapp Flagler, of Boston, Massachusetts, in the United States of America.*)—" Improvements in welding tubes, pipes, and other tubular or circular articles, and in apparatus to be " used therein."

The object of this invention is to prevent the round bar and ball used in welding tubes, pipes, and other tubular articles from turning during the welding operation, and also to improve the construction of the ball.

The invention consists, firstly, in holding the bar from turning by constructing it square at its rear end, and passing it between two rollers having V-shaped grooves; and secondly, in a hollow welding ball formed at one end on the interior, with longitudinal lugs arranged to form a bearing on each side of a square shaped shoulder on the front end of the bar.

A.D. 1875, January 26—No. 291.

ESPIR, Camille, of 59, Berners Street, Oxford Street, in the county of Middlesex, merchant.—(*A communication from Jean-François Auguste le Bricquir, of Marseilles, France.*)—" A new or improved " mining powder, also applicable to blasting purposes."

The feature of novelty of this invention is, that it consists of three materials only, and the following are the proportions, though I do not confine myself to these exact proportions, as they may be varied as circumstances may require:

60 per cent refind nitrate of soda.
14 ,, refined and triturated brimstone.
26 ,, sawdust from strongest wood, such as oak, walnut, mahogany, ebony, logwood, &c.

In order to increase the explosive power add five per cent of nitrate of soda.

A.D. 1875, January 26.—No. 292.

MOUNTFORT, Walter, and **MOUNTFORT, Ernest Chesmer**, of 17, New Street, Birmingham, in the county of Warwick, fancy goods dealers.—" An improved game, and instruments and appliances " connected therewith."

A ball suspended by a cord from an arm attached to a vertical rod is thrown by the player in such a manner that it winds itself round the said rod till the whole of the line is taken up, when it immediately begins to unwind, and acquires in this action sufficient centrifugal force to describe a curve upon detaching itself from the said rod, and in its path to strike-off or set free a ball which indicates numbers, either by rolling into concavities in a board or by other suitable contrivance.

A.D. 1875, January 26.—No. 293.

FEWSTER, William, of Pier Office, Margate, in the county of Kent, master mariner and harbour master of Margate, aforesaid.—" An improved method of and apparatus for saving life and property " at sea."

The invention is constructed in the shape of a duck with two heads and two necks, one at each end, the one at the fore end turned aft, and the one at the after end turned forwards, both looking downwards forming air pipes answering for ventilation.

The duck is constructed in the bottom to be fitted with water tanks over which will be a platform for provisions, passengers, luggage, ship stores, &c.; above this will be a deck forming the flooring of saloon, steerage, and cabins. The mast will be hollow and stepped one-third of the length of the duck from the fore end, answering for chimney of stove, also for ventilation.

The duck will vary in size according to the size of the ship and number of passengers she carries.

The duck's nest is built in the ships 'tween decks supported to and from the sides of the ship exactly the shape of the duck and can be built either of wood or iron. It is perforated up to ten feet, the draft of the duck; the duck itself can also be of wood or iron and suited either to poop or flush decks.

When the ship founders, the duck would float with passengers, crew, nautical instruments, &c., all saved.

The duck being placed in the aft third of the ship, her mast will serve as the ship's mizen mast.

In case of fire the captain would scuttle the ship.

A.D. 1875, January 26.—No. 294.

CANNON, William George, of 111, London Road, Southwark, in the county of Surrey.—"An improved cup and ball joint for gas pendants and chandeliers."

This invention consists in an arrangement at the bottom of the cup, viz., a box to contain a vulcanite or leather ring or washer held in by a cap screwed to the cup. The ring or washer to be large enough to allow the tail piece or suspending rod to pass through freely, but smaller than the hole in the bottom part of the cup.

A.D. 1875, January 26.—No. 295.

JENSEN, Peter, of Chancery Lane, London.—(*A communication from Auton Bohlken, of Varel, Oldenburg, architect.*)—"A new or improved washing machine."

Revolving cylindrical cask ribbed inside; an internal loose ribbed heavy roller presses on the clothes.

A.D. 1875, January 26.—No. 296.

WIRTH, Frank, of the firm of Wirth and Company, patent agency, of Frankfort on the Main, in the Empire of Germany.—(*A communication from Josef Leiter, manufacturer, a person resident at Vienna, in the Empire of Austria.*)—"Improvements in electric apparatus."

All batteries hitherto constructed, especially those which have to be transported, have the disadvantage that when they were charged they could not be hermetically closed, and that when the elements had to be lifted out a complicate mechanism was necessary. If such batteries were to be transported for some distance, the several parts of them and the acid had to be packed in separate vessels. Elements that remain filled during the time when they are not employed consume metals and acids uselessly and are readily spoiled. All these disadvantages are avoided with my apparatus.

A.D. 1875, January 26.—No. 297.

ALLAN, William, of Sunderland, in the county of Durham, engineer.—"Improvements in drilling machines for drilling boiler shell plates and similar work."

This Provisional Specification describes the construction of a drilling machine having each drill driven by its own engine and having the drill base traversing round a circular bed so as to perform the work exactly in line with the common centre. The machine drills boiler shell or other plates when placed vertically which is the most expeditious mode of performing that mechanical operation.

A.D. 1875, January 26.—No. 298.

WILLIS, James, of Stocksbridge Works, near Sheffield, in the county of York.—"Improvements in umbrellas and sunshades."

The improvements relate to the formation of a new stretcher joint for paragon ribs, and also to a mode of obtaining the effect of a spring stretcher joint without adding a spring to the joint.

A.D. 1875, January 26.—No. 299.

WALTON, Thomas, of Birmingham, in the county of Warwick, lock manufacturer.—"Improvements in locks."

According to this invention the stump of lever locks instead of being carried by the bolt is carried by an oscillating plate, acted upon by the key; and the bolt is worked from the said oscillating plate by an arm engaging with a forked strap of the bolt. The key first lifts the levers, and afterwards gives motion to the oscillating plate, which plate by its motion shoots or withdraws the bolt, and carries the stump on it from one set of gatings in the levers to the other set. This mechanism is specially applicable to double handed lever locks, the lock plate of the said locks having a double keyhole in the same line, into one or other of which keyholes the key is introduced, according as the lock is used with a right or with a left handed door or article.

The tongues of buckle locks are jointed, either to the side of the lock case or to the end bar of the buckle frame. In the former case the tongue is fastened down by the lock bolt passing under the heel of the tongue, and in the latter case by the lock bolt passing over the point end of the tongue.

A.D. 1875, January 26.—No. 300.

ROGERS, Benjamin William, of Stourport, in the county of Worcester, machinist.—" Improvements " in machinery for the manufacture of screws and bolts and other like articles."

This invention has reference to the feeding mechanism of the said machinery by means of which blanks are removed one at a time from the feeding rail and transferred to the clams, by which they are seized and held while being operated upon. An arm or lever, moving in a vertical plane, has at its end a fixed inclined finger, which is also curved on its outer-side. To this fixed finger a second or sliding finger is connected, the blank to be fed being held by the end of the sliding finger in a fork of the fixed finger. When the lever carrying the fingers is in its raised position, the fingers are sufficiently opened to permit a blank to pass from the feeding rail between the ends of the fingers. On the descent of the lever the fixed finger first advances, seizing the blank between it and the end of the sliding finger. The two fingers now descend together holding the blank between them. The clams close and retain the blank. The lever now ascends, and the sliding finger permits the escape of the blank from between the fingers. On the lever arriving at the top of its stroke the fingers open and another blank is fed into them from the rail, and so on.

A.D. 1875, January 26.—No. 301.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Joseph Constant, of Paris, in the Republic of France.*)—" Improvements in the " fitting or connecting of tubes to tube plates or holders, and in apparatus employed therefor or in " connection therewith."

This invention relates to an improved mode of fitting or connecting tubes to tube plates or tube holders, which is more particularly applicable to the tubes of tubular boilers, but may also be employed for other purposes where tubes are required to be secured to plates or holders, and it consists essentially in the employment of tubes or washers composed of an asbestos fabric or similar fire resisting material, and by preference slightly conical or tapering, placed around the extremity of the tube, which is to be connected to the plate or holder in combination with conical or tapering tubes or washers composed of iron or other suitable rigid material, and placed outside of the asbestos tubes or washers, the taper of the two being by preference arranged in reverse directions, so that when the metal tube or washer is driven in around the asbestos tube or washer and between it and the sides of the aperture in the tube plate provided for the reception of the tube, the latter will be firmly secured in its place.

The invention also embraces apparatus for fitting and removing the tubes and washers.

A.D. 1875, January 26.—No. 302.

CONNELL, Andrew, of the town and county of Kingston upon Hull, oil foots refiner.—" Improve- " ments in the construction of wagons and other receptacles for transporting coal, minerals, and other " like materials."

This invention consists in the construction of the box portions of mineral wagons separately from the frame or running portions and with hinged movable bottoms through which the contents are discharged and in the modes by which the contents of such wagons are caused to be discharged into vessels.

The invention also consists in the construction of boxes similar to the box portions of the wagons for use in the transport of minerals when facility of loading and unloading without manual labor is desired.

A.D. 1875, January 27.—No. 303.

VARLEY, Cromwell Fleetwood, of 2, Great Winchester Street, in the city of London.—" Improve- " ments in couplings for repairing propeller and other shafts."

This Specification describes improvements on No. 468, in the year 1873. In order to do away with the necessity of cutting a key way in the two halves of the shaft to be coupled, the interior of the coupling has teeth formed upon it to bite into the parts of the shaft, or carries paw like keys formed to bite into the shaft or keys with a number of teeth upon them. Or vulcanized india rubber, or such like material is placed between the coupling and the shaft. To reduce the number of bolts required, the sections of the couplings are hinged together. The couplings may be made in three or more sections. Where the fracture occurs at a distance from any of the flanges, each section of the coupling may be in one piece. To reduce the weight of the coupling, the tubular parts of the coupling are made to taper from the centre, and are strengthened with surrounding rings.

When keys are used at the junctions of the coupling, the outer surface of the keys is made concave,

A.D. 1875, January 27.—No. 304.

MARCHANT, Robert Mudge, of Kirby Street, Hatton Garden, in the county of Middlesex, civil engineer.—"Improvements applicable to furnaces and to firing the same."

This Provisional Specification describes the carrying of a steam pipe into the furnace, and the connecting of an oil pipe to this steam pipe, so that the oil percolates slowly into the steam pipe and becomes vaporized and mixed with the steam before reaching the furnace. The combined steam and oil vapor issue by one or more jets, and are burnt as the fuel of the furnace.

Also, the carrying of the pipe in a serpentine or other course through the furnace, so that the combined steam and oil vapor may be highly heated before issuing from the jets.

Also, the employment of a similar steam pipe where solid fuel is used; the steam in a superheated state issues through jets among and mingles with the gases evolved from the fuel and is burnt therewith.

Also, the so arranging the chimney or chimneys that they shall deliver the exhausted products of combustion in their still heated state underneath the fire or flame, such products being thus continually circulated through the fire.

A.D. 1875, January 27.—No. 305.

SPEYER, Martin, of the firm of Messieurs Martin, Speyer, and Company, of Manchester, in the county of Lancaster, merchant.—"Improvements in the construction of portable sheds or tents."

My improved sheds or tents consist of two or any greater number of wrought iron principals made by preference of bars of rolled **T** iron, which are bent to the shape of the roof and sides: the portions forming the sides are hinged to the portion supporting the roof, and the corners are strengthened by diagonal stays. The principals are united by angle or other shaped iron cross bars, which are jointed together for the convenience of transport, and locked together by tie rods at the ridge pole and sides.

The roof and sides are made of tarpauling or other fabric.

A.D. 1875, January 27.—No. 306.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Emile Cornely, of Paris, France.*)—"Improvements in edging "machines."

The object of this invention is a machine for making the edging on articles scolloped on their borders, such as curtains, ladies wearing apparel, table covers, etc., etc., and where ordinary binding is not employed; the edging made by the machine being sufficiently strong to permit the material to be cut out, and being at the same time an ornamental stitch, as is required on the goods above mentioned.

To effect this, two needles or needle hooks are employed, which are either fixed in one and the same needle-bar, or in two parallel needle-bars set close together, and which stitch a ribbon on to the material to be edged, so that the needles or hooks will stitch into the edges of the ribbon, and sew the same to the material by means of two rows of chain stitches which appear on the face of the ribbon. But to imitate fully the Swiss edging, a special ribbon is used, this ribbon being woven in such a manner that the woof only shall be plainly visible on its face, it being made of of thick thread, while the warp, consisting of thin threads, shall be visible, but very faintly on the face of the edging, and the edging thus made will have the appearance of two parallel chain stitches interlaced by thick transversal threads resembling in appearance the Swiss edging made on curtains.

To guide the ribbon so that the needle hooks will always stitch into its edges, it is conducted by means of a guide which works in combination with the universal feed motion of an embroidering machine, such as the "Bonnaz" embroidering machine, and which will present the ribbon to the needles in following all the sinuosities of the borders to be edged.

A.D. 1875, January 27.—No. 307.

JENSEN, Peter, of Chancery Lane, London.—(*A communication from Auton Bohlken, of Varel, Oldenburg, architect.*)—"A new or improved earth boring auger, applicable as an anchor or means of "fastening or attachment."

The lower part of auger is formed as two separate screws, the lower one having the smallest pitch; it has also a cutting blade to which a chain is attached for pulling the auger out.

A.D. 1875, January 27.—No. 308.

DEVERELL, Wykeham Travel, of the City Liberal Club, 71, Queen Street, in the city of London, and TOWER, Beauchamp, of Moreton, in the county of Essex.—(*Partly a communication to Wykeham Travel Deverell, from Spencer Ruding Deverell, of Portland, in the Colony of Victoria, and partly an invention of the said Beauchamp Tower.*)—" Improvements in obtaining motive power from the motion of a ship " or other floating body among waves."

The invention consists of an improved apparatus for utilizing the motion imparted to a ship or other floating body by waves as a means for obtaining motive power. A ship or other floating body has imparted to it by waves a combined horizontal and vertical oscillation which combined movement results in the floating body moving in an approximately circular path in a vertical plane, and consequently causes it or any object placed on it to be acted on by a centrifugal force.

A.D. 1875, January 27.—No. 309.

FOX, George, and FOX, John Henry, of Carlinghow Batley, in the county of York, woollen manufacturers.—" Improvements in machinery or apparatus employed in finishing woollen fabrics."

This invention relates to machinery to be employed for producing what we call the " lamb-skin " finish upon woollen fabrics. After the cloth has come from the raising gig we pass it through a " setting-up " machine, the bed of which consists of a board placed edgewise so as to offer a very small portion of the cloth to the action of the brush employed for " setting-up " the fibres. The cloth is next passed through a " napping " machine, the rubbing action of which is reciprocatory and not circular as in the ordinary machine. As the fabric passes through the machine the " set-up " fibres are knitted or worked together and laid in a direction parallel with the length of the cloth.

A.D. 1875, January 27.—No. 310.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from William Henry Farris, of Cairo, Illinois, United States of America, Captain.*)—" Improvements in water circulating bars, and other apparatus for the furnaces " or fire boxes of steam boilers and water heaters, including a method of preventing injuries by " leakage at any part of such apparatus."

This invention relates to improvements in water circulating and steam generating side or basket grate bars, fire front linings, and rear arch bars, and to the combination therewith, and with circulating grate bars not having side basket bars of pipes and valves for applying the same. The said invention is applicable to locomotive and other boilers and to water heaters.

A.D. 1875, January 27.—311.

BOULTON, John, Captain and Adjutant, Edinburgh City Artillery Militia, residing at Number 8, Inverleith Terrace, Edinburgh.—" Improvements in apparatus for calling the attention of engineer, " stoker, and guards in charge of a railway train to danger signals."

The features of novelty are.—A projection made to rise between the rails working either in connection with a danger signal or placed on any part of the line. This projection operates on the apparatus for giving the alarm after mentioned.—This apparatus is carried by the engine or any of the carriages, and the bottom or dependent arm of this apparatus is made to swing on a pivot, and the apparatus being carried at a lower level than the top of the projection, and so placed as to strike the projection, the dependent arm must rise to enable it to pass over the projection.—The dependent arm is so formed at the top that on being raised by the projection as aforesaid, the shoulder of the dependent arm rises to a higher level than the top of it while at rest, and in so rising lifts a rod resting on the top of it.—This rod being thus raised presses a spring and thus withdraws a small bolt by which a chain or cord is retained.—The other end of this cord or chain is attached to the object which is to be operated upon in order to attract the attention of the man in charge.—The object which is to attract attention may be either a bell, the steam valve of the engine, or a broad colored plate, or other prominent object, and may be either a part of or attached to the engine or carriage, and will be so acted on by a spring or weight, that on the bolt being withdrawn and the cord released as aforesaid, the steam whistle or bell or the prominent object will remain sounding, or exposed, as the case may be, until the attention of the man in charge is called to it.

The advantage of my invention is that it provides a simple and efficacious signal by appealing to other senses in aid of that of sight.

A.D. 1875, January 27.—No. 312.

RIGBY, John, of Dublin, Ireland, and **SCOTT, William Middleditch**, of Birmingham, in the county of Warwick.—" Improvements in the contraction and strengthening of the barrels of breech-loading " shot-guns."

This invention consists of three modifications. *First.* The muzzle end of the barrel is contracted, and at the same time strengthened by driving or shrinking thereon an external tube of steel or other suitable metal. *Secondly.* Additional thickness of metal is left on the outside of the muzzle and of the barrel and afterwards transferred to the inside thereof by external pressure, thus producing the required contraction. *Thirdly.* An annular depression is made on the exterior of the muzzle end of the barrel, whereby a corresponding annular contraction is produced in the interior thereof The effect of the contraction of the barrel is to cause the shot to be delivered more closely than by the ordinary method of construction.

A.D. 1875, January 27.—No. 313.

BRIÈBACH, Justus Albert, of No. 1, Meltham Villas, Rendlesham Road, Clapton, in the county of Middlesex, gentleman.—" Improvements in the means of and apparatus for indicating the position of " the rudders in vessels to avoid collision."

This invention relates to an apparatus to denote to approaching vessels the course that any vessel is steering, and enable the man at the wheel or officers on board any ship to steer accordingly, thereby to avoid collision. I therefore employ a lamp placed in the stem of the vessel, or so near thereto as may be practicable, having attached to it a bi-coloured slide, corresponding to the position of the rudder or helm when in motion, & having a vertical action. The position of the rudder or helm is, by a rod passing under the deck, and being attached to the lamp, and having connection with the rudder post, indicated by the above slide.

A.D. 1875, January 27.—No. 314.

KENNEDY, James, of Liverpool, in the county of Lancaster, civil engineer and **WIGG, Charles**, of Liverpool, aforesaid, alkali manufacturer.—" Improvements in the construction of furnaces."

The essential feature of this invention consists in an improved construction of furnace to be employed more particularly for effecting the reduction of iron ores or products such for example as the oxide of iron in conjunction with a reducing agent or agents, such for example as carbon, and it consists in arranging a furnace or heating chamber containing retorts or tubes (placed vertically or otherwise) into which the mixture of oxide of iron, and the reducing agent or agents is to be introduced in combination with a puddling furnace or furnaces or with other furnaces in such a manner as to more completely utilize the gases or waste heat from the latter for effecting the reduction of the ores or products before mentioned,

A.D. 1875, January 27.—No. 315.

BROCKBANK, George Henry, of Montgomery Road, Acton Green, in the county of Middlesex, pianoforte manufacturer.—" Improvements in the actions of pianofortes."

For this purpose the hammer is brought back by means of a weight and in front thereof is fixed a spring rail having springs fixed thereto which bring back the sticker.

A.D. 1875, January 27.—No. 316.

HILDEBRANDT, Albert, civil engineer, of Bow Chambers, 55, Cross Street, Manchester, in the county of Lancaster.—(*A communication from Gustav Niemann and Theodor Geiger, civil engineers, of Vienna, Austria.*)—" Improvements in tramways."

This invention mainly consists in laying the rails of tramways on a number of supports or chairs made by preference of cast metal, and if of metal they are made hollow in the shape of an open box, and bridged over on the top with a recess to receive the rail so that the upper surface of box and rail is practically level. The box may be filled in with any suitable material. For fixing the rails to the chairs small keys or wedges are driven into grooves formed on one side of the recess pressing the rail against the other side of recess. To keep the gauge, tie rods may be used.

A.D. 1875, January 27.—No. 317.

ORMSON, Henry, of Stanley Bridge, Chelsea, in the county of Middlesex, horticultural builder and hot water apparatus engineer.—"Improvements in hot water apparatus, and boilers for heating same, " said boilers being also applicable to other uses."

This invention mainly relates to a divisional or a single, double, treble, and quadruple system of heating by hot water apparatus, effected by arranging the stacks or ranges of hot water pipes in connection with duct or chamber having valves so disposed that some or all of them may be turned on or off, and thus leave in operation or shut off some or all of the pipes. A boiler is preferrred to be used of a dome shape, and so constructed that stoke holes and deep setting are dispensed with. The feed to the boiler and water circulation is effected by an arrangement of circulating box and pipes which communicate with the heating pipes and the return water from which passes into the boiler by return pipe by leg or dip part of boiler. Various accessory details are described.

A.D. 1875, January 27.—No. 318.

MITCHEL, William Haslett, of Newry, in the county of Armagh, Ireland.—"Improvements in the " mode of working cut-off slide valves for engines worked by steam or other fluid pressure."

The present invention relates to that class of combination steam engine valves in which a cut off valve actuated by steam pressure is mounted on the back of the ordinary slide valve, the action of such cut-off being placed under the control of the governor so as to produce a self acting variable cut-off.

A.D. 1875, January 27.—No. 319.

REYNOLDS, William Francis, of Nightingale Lane, London Docks, in the county of Middlesex, nautical instrument maker.—"Improvements in ships' logs and in appliances connected therewith."

This relates to tubular logs suspended at about the centre of their weight and held by a rope from the vessel's side, the rotating part only going into the water.

The central spindle has radial wheels of long bearing form to prevent canting.

The rotator is made of strips of metal fastened to a piece of wood.

A.D. 1875, January 28.—No. 320.

REES, Evan, of Neath, in the county of Glamorgan, and GARDNER, Sankey, of Eaglesbush Foundry, Neath, in the county of Glamorgan.—"Improvements in fire-bars."

Bars are made of double V form in section or of square or rhomboidal form set diagonally. The distance pieces are in some cases caused to interlock.

A.D. 1875, January 28.—No. 321.

TAYLOR, Robert, of Oldham, in the county of Lancaster, machinist.—"Improvements in machinery " for tapping screw threads."

The spindle to which the tap is secured is turned round alternately in opposite directions by a driving strap and three pulleys, one of which is fixed to the spindle and the other is provided with internal teeth gearing into a carrier pinion which drives the spindle.

The strap is moved to and fro over the pulleys by a self acting apparatus actuated by the slide.

A.D. 1875, January 28.—No. 322.

HOWARTH, William, and HOWARTH, Ambrose, both of Bradford, in the county of York, dentists. —"Improvements in lathes for dental and other purposes."

The headstock of our improved lathe consists of a spindle with a toothed wheel at each end; these pinions gear into other pinions fixed on short axles, each set being supported in a box with a face-plate; these short axles have taper sockets in which the different tools are fixed, and the articles of dentistry or other articles to be operated upon are presented to the different tools in succession.

The details may be modified.

on one side and shelving up to the top on the other side. He closes the ends of the vessel or trough to retain the metal to be acted upon, and forms an opening in the top of each end, one for the admission and the other for the discharge of the molten metal.

He forces air through tuyeres placed along that side of the vessel or trough to which the bottom shelves up, and inclines the tuyeres towards the surface of the metal with their nozzles nearly touching the metal, so that the air will be forced into and through the metal. He carries up the sides of the vessel or trough and covers the top with a perforated plate.

The metal flows through the vessel or trough and is purified by the action of the injected air.

A.D. 1875, January 28.—No. 328.

CADOGAN, The Honourable GEORGE, of Park Place, in the city of Westminster.—"Improvements in "apparatus for igniting and holding matches."

This invention consists in arranging a corrugated cylinder so that it can revolve within an outer plain cylinder. Each corrugation contains a match, and in the outer cylinder is formed a longitudinal slit in which works a carrier. When this carrier is forced down and the corrugated cylinder turned round until a match is exactly above it, the carrier when raised fits and holds fast the lower end of the match. Inside the corrugated cylinder is another cylinder which can be turned partly round by a handle attached to it, and the top of this cylinder is provided with a disc, the lower surface of which is roughened and covers the heads of the matches in their corrugations. When the disc is turned sharply round by the handle, it ignites the match which is pressed against it by the carrier by means of a spring or the finger of the operator, and when the handle has completed its stroke it brings a notch in the disc exactly over the ignited match, which is forced through it by the carrier and can then be used. A shield or lantern is fitted outside the outer cylinder, and can be raised so as to protect the lighted match from the weather. When the handle and disc are returned to their first position, a pall connected to the handle actuates a ratchet wheel upon the corrugated cylinder, and brings a fresh match into position above the carrier. Two cylinders may be used side by side, the match being ignited between them, and the shield or lantern partially surrounding both. A ring is used to insert the finger to carry the apparatus. Sometimes only two cylinders are used, the internal one serving as a reservoir for matches and having a slit through which a single match can pass into a slit in the outer cylinder above the carrier.

The apparatus may be made ornamental, and may contain an inkstand or other article, and may be adapted for fusees instead of matches.

A.D. 1875, January 28.—No. 329.

BURDESS, ADAM, of Coventry, in the county of Warwick, watch manufacturer.—"Improvements "in mechanism for working the brakes of railway carriages, wagons, and trucks."

This invention consists of the following mechanism for automatically working the brake blocks when the buffers and buffer springs are brought into operation. On the buffer rod is an arm, the folded end of which embraces the free end of a lever parallel to the buffer rod or cam or "rise" on the said lever, when the buffer rod is pressed inwards drawing the said lever towards the buffer rod. On the said lever is a short horizontal cross lever, the free end of which is nearly in contact with the face of the wheel. When the buffer rod is pressed inwards this cross lever is made to bear against the wheel, which wheel by its onward motion gives motion to the said cross lever, the motion of the latter being transmitted to a cross connecting rod parallel to the axle of the pair of wheels, so as to draw the said cross connecting rod inwards. This cross rod carries a fixed loop, in which loop a pin on a cleat on the buffer rod engages. When the cross rod carrying the loop is drawn inwards by the action of the cross lever the cleat is forced inwards and the brake block brought into operation. The cross lever is made to operate cleats on the buffer rods at both ends of the carriage, so as to simultaneously work the brake blocks of all the wheels of the carriage.

A.D. 1875, January 28.—No. 330.

SANDERS, JAMES HARRIS, of 31 and 32, Lombard Street, in the city of London.—"Improvements in "the manufacture of cartridge cases and percussion caps."

According to this Provisional Specification cartridge cases are made out of steel coated with other metals.

Percussion caps are also made from steel coated with other metals.

Fitting or applying a guard with a screen plate in front of the exterior of the case so as to prevent both plungers, keys, or tappers being moved or operated upon at the same time.

Also arranging the combination of a permanent magnet with the 2 poles or terminals beneath or in a different plane to the poles or terminals of an electro-magnet, of which one is on each side and above the permanent magnet, and so placing a compound armature and needle mounted on the same spindle between them that the current, on traversing the electro-magnet, magnetises the compound and curved armature, which is attracted by the one pole, and the other pole repels the other end of the same armature, whilst the pole of the electro-magnet which is repelling the said armature is at the same time attracting the needle, and the reverse pole of the electro-magnet at the same time repels it.

Also in a novel arrangement of key and apparatus, whereby the instrument is kept free from the disturbing effects of lightning, earth currents, line contacts, and such like disturbing causes by a peculiar arrangement of spring contact pieces and insulation. And to the bell, gong, or relay, there is applied 2 springs which are acted upon and brought in metallic contact as described. By this arrangement any error is prevented if the receiver by any accident uses both the sending and receiving portions of the apparatus at the same time.

Also an arrangement of interlocking gear for preventing the signals for working traffic between branch lines and the main line (or vice versâ), or on single lines of railway, to prevent two trains being taken or admitted on to one section of the line at the same time. This is effected by the use of a double-ended lever-arm or "yoke" fitted on the bottom of the case connected to the battery or earth as between 2 or more instruments so as to insure the signals being consonant and harmonious, and in no case conflicting or contradictory. This "yoke" is alternately acted upon by one or other of the plungers, tappers, or keys, and cannot be acted upon by both of them at the same time.

The battery and battery-cells for working such instruments are made by forming the plates of silver with vertical corrugations to give them structural stability to prevent their buckling or bulging-out, and prevent their coming in contact with the zinc plates. The cells are formed with small pockets on each side at the bottom for receiving a limited quantity of mercury and the ends of the zinc plates dipped thereinto.

A.D. 1875, January 28.—No. 337.

PENDLETON, Henry Garner, of Birmingham, in the county of Warwick.—"Improvements in fas-"tenings for braces, belts, wristbands, purses, pocket books and various other articles."

This invention consists mainly in constructing a fastener for the various articles of three parts, a "front," a "back," and "pushers." The front is made of any pattern and parts bent to form the sides with suitable pieces for securing it to the back which is cut to fit the sides of the front. Space is left between back and front. A tongue is in the back forming a spring, at the loose end of which is one or more teeth. The pushers are arranged so that, by the action of pushing them in, the tongue is raised and the pushers are placed outside the back or between the back and front, suitable guides being made to regulate their movements.

A.D. 1875, January 28.—No. 338.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Charles Edwin Robinson, of the city, county, and state of New York, United States of America.*)—"Improved apparatus for feeding and burning crude oils and other liquid hydrocarbons "in furnaces."

The invention consists 1st in improved apparatus for feeding the oil to the burner by direct pressure of the steam, and 2ndly in the burner by which the steam and oil are admixed in relative proportions and spread out in contact with atmospheric air and burned within the furnace.

A.D. 1875, January 28.—No. 339.

BEWSHER, John, of St. Thomas's Gardens, Haverstock Hill, in the county of Middlesex, solicitor.—"Improvements applicable to printing machinery."

The object of this invention is to obviate the difficulty hitherto experienced (more especially in book printing machines) of preventing what is termed the "set off."

A.D. 1875, January 29.—No. 340.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from David Robert Brownlow and George Weedne Francis, both of Middletown, Connecticut, United States of America.*)—" An improved coating for iron and other " metals."

This invention relates to an adhering coating for iron and other metals, composed of the ordinary slag from an iron furnace, or its equivalent, and borax or other equivalent flux, by means of which the metal is perfectly protected from the action of the air or of moisture, and so that the metal can be subjected to a high degree of heat without injury to itself or the said coating.

A.D. 1875, January 29.—No. 341.

WESTWOOD, Joseph, and BAILLIE, Robert, both of the London Yard, Poplar, in the county of Middlesex, engineers.—" Improvements in corrugated wrought iron plates for bridges, warehouses, " and other buildings."

The plates are intended for the construction of iron floors, and for this purpose are made with increased bearing surface by forming the top and bottom parts of the corrugations flat and extended, and the sides thereof straight and inclined outwards towards the bottom.

A.D. 1875, January 29.—No. 342.

PIERI, Philippe, retired officer of the French Imperial Army, and **SMITH, William**, consulting engineer, both of 19, Salisbury Street, Strand, London, and 3, York Buildings, Dale Street, Liverpool. —" An improved bidon and drinking bottle for military and tourist purposes."

Constructing a " bidon " or drinking bottle or flask with a neck of suitable dimensions with an inverted truncated cone fitted therein, having at the bottom thereof a hole or opening for receiving the fluid or through which it may be poured, and at the top edge thereof another hole or opening from which the fluid contents may be poured out or withdrawn therefrom. Such inverted truncated cone is so fitted that the apex is by preference brought in contact with or near to the one side of and near to the bottom of the neck in which it is applied.

A.D. 1875, January 29.—No. 343.

PAYTON, Walter, of Shelgate Road, in the county of Surrey, mechanical engineer, and **HOLMES, Joseph Ellicott**, of Newton Terrace, Bayswater, in the county of Middlesex, civil and mechanical engineer.—" Improvements in saws and sawing machinery."

One part of our invention relates to a method of giving a percussive action to the teeth of saws by means of short cranks or eccentrics moving in a similar direction and at equal speeds. The second part of our invention relates to a method of giving percussive action to a saw for the purpose of cutting coal, stone, and other substances by adapting it to an ordinary rock-boring machine or to a reciprocating engine or other motor, which would impart to it parallel percussive blows.

A.D. 1875, January 29.—No. 344.

BROOK, William Pitt, of De Crespigny Park, Denmark Hill, and **WILSON, Matthew**, of Loughboro' Road, both in the county of Surrey, Esquires.—" Improvements in rotating cooking apparatus to be " used in ovens or in combination with stoves, kitcheners or the like."

Our said invention relates to apparatus consisting of a revolving plate on two or more such plates fitted in an ordinary domestic oven or other oven or placed upon the said oven or over or at the side of a fire-place, and caused to rotate automatically, the said apparatus being designed for baking such articles as are ordinarily baked in ovens and for boiling water and other like purposes.

A.D. 1375, January 29.—No. 345.

PALMER, Henry Thomas, of Middleton, in the county of Lancaster, consulting engineer.—" Improve" ments in connection with the footsteps and lower ends of the spindles of mules and mule doublers."

The object of this invention is to prevent the waste of oil or other lubricant used for lubricating the bottom ends or feet of the spindles, and consists in the construction and employment of covers of the spindle steps formed of sheet metal, wood, leather, or other suitable material, the covers being made of any desired lengths.

In one arrangement each length of cover is made of one piece, having round or oblong holes through which the spindle feet pass, and when in use rests on the bottom rail containing the footsteps, thereby preventing the oil from being thrown out and reducing to a great extent the entrance of dust, dirt, and loose fibres.

In another arrangement of covers, in which each length is made of one piece, slots extending from one edge are used instead of holes, and in other arrangements the covers are each made of two pieces, having semicircular recesses nearly fitting the bottoms of the spindles; when in use the two inner edges being in close contact or overlapping each other, or one half cover may have a straight inner edge almost in contact with the spindle bottoms, and the other half cover having slots through which the bottoms of the spindles pass and overlap each other, and in all cases the covers are capable of being raised or removed for the admission of oil or for cleaning, and also kept in their places as covers by ribs, recesses, pins, hinges, or other ordinary means.

A.D. 1875, January 29.—No. 346.

HALL, James, of Wrays, Horley, in the county of Surrey.—" Improvements in lime and cement " kilns."

This Provisional Specification describes a cylindro-conical kiln covered over with a dome formed in two parts, one of which is movable along a railway so as to afford a ready access to the interior. An opening at the bottom of the kiln is provided with gridirons, beneath which is a chamber having trap doors at the bottom. To withdraw the charge the gridirons are moved back, the lime then descends and fills the chamber; the trap doors may now be opened to allow the lime to fall into the trucks arranged below. The kiln may be used with solid or with gaseous fuel.

A.D. 1875, January 29.—No. 347.

ZYSEL, Francis, of Berner Street, Commercial Road, and **WARSCHAWSKY, Joseph**, of Princes Street, Spitalfields, in the county of Middlesex.—" Improvements in tailors' pressing or ironing " machines, also applicable to other machines for pressing or ironing."

This invention relates to improvements in pressing or ironing machines for the use of tailors and others.

The apparatus is constructed with a table and framing of convenient height and underneath which is placed a suitable arrangement of driving gear for actuating a travelling band upon which the articles to be pressed or ironed are carried.

This band is situated at the fore part of the table within easy reach of the operator, and is carried by two horizontal transverse shafts, one of which projects in front of the frame, and parallel with it another short shaft also projects for an equal distance, and round these projecting parts a smaller band runs and is used for pressing trousers' bottoms and similarly formed articles, and on the projecting end of the transverse shaft a wooden roller may be placed when required to be used for pressing circular seams.

Near one end of the travelling band is a trough filled with water, and in it is placed a roller revolving on a spindle on one end of which is a spring. Round this roller is wound a damping cloth, which passes thence through two squeezing rollers, which press all superfluous moisture therefrom. When the cloth is used and released the spring draws it back and re-coils it round the roller.

At the rear part of the table is a standard, an upper part of which is capable of being turned round its centre and is provided with projecting side parts in which are elongated slots through which slide metallic pieces holding a pin passing through the second joint of a system of lazytongs, behind these slots are holes holding another pin running through the first joint of the tongs and holding them in position; the metallic pieces limit the movement.

At the opposite end of the lazytongs a similar connection is made with a box, to which is attached a spring, carrying the press or iron capable of free turning movement, and the pressure of which upon the material is regulated as required by a rack and pinion actuated by a handle and working in connection with a ratchet and pawl, so that upon releasing the latter the spring lifts the iron immediately clear of the material.

The iron is formed of a long oval box closed all round, and between the gas burner and the top is placed a horizontal plate shorter than the iron, and which causes the heat to travel along the bottom and then the top of the iron before it can escape through an outlet left at the top and rear of the iron.

A.D. 1875, January 29.—No. 348.

DOUGLAS, WILLIAM HENRY, of Stourbridge, in the county of Worcester, watch maker.—"Improvements in sewing machines."

This invention consists of the following improvements for closing the fingers of kid and other gloves and also for sewing or closing other articles of a tubular figure. Instead of a table for supporting the article to be sewn, a horizontal tube elliptical in cross section is employed, the said tube being jointed at one end to the frame of the machine so that it can be turned aside. On the upper side of the tube is an opening through which the needle of the machine passes. A rod in the axis of the tube travels backwards and forwards therein, the rear end being connected with the ordinary mechanism for giving motion to the shuttle, and the other or front end being connected to the shuttle carrier. The glove finger or other tubular article having been placed on the tube and the latter turned down horizontally, the working of the machine effects the complete closing or sewing of the glove finger or tubular article.

A.D. 1875, January 29.—No. 349.

CHIVERS, SAMUEL, of No. 15, Dumfries Place, Cardiff, in the county of Glamorgan, manufacturing chemist, and **CHIVERS, ALFRED**, of Pontypridd, in the said county, manufacturing chemist.—"Improvements in apparatus for concentrating sulphuric acid."

This invention consists in substituting a glass retort for the platinum retort ordinarily used in effecting the concentration of sulphuric acid continuously. The "brown acid" is passed continuously through a feed-cup and a self-adjusting syphon into the said retort, from which the concentrated acid is passed through a syphon into a cooler, from which it passes by an adjustable syphon into a cup furnished with a spout.

A.D. 1875, January 29.—No. 350.

SHEPHERD, EMANUEL, ROTHWELL, FRED, HOUGH, JAMES EDWARD, and **ROTHWELL, TOM**, all of Oldham, in the county of Lancaster, and **RIMINGTON, JOHN MCNAY**, of the town and county of the town of Newcastle-upon-Tyne, manufacturers.—"Improvements in sewing machines."

The first part of this invention consists in improvements in the apparatus for regulating the length of the stitch of sewing machines. A short lever is jointed at one end to the bar which carries the feed plate, and bears against a cam placed upon the main or driving shaft of the machine for the purpose of imparting the to-and-fro motion to the feed plate, and the end of the feed plate bar rests upon another cam also placed upon the main shaft for the purpose of giving the upward and downward motion to the feed plate. In order to alter the length of stitch, it is necessary to vary the position of the fulcrum of the short lever, and which fulcrum is formed by one end of an arm bearing against the same, and which arm is pivoted at or near its centre. A longitudinal bar is placed lengthwise underneath the bed-plate of the machine and pivoted at any convenient point, and provided at one end with a set or thumb-screw which works in a slot in the bed-plate. The other end of the longitudinal bar is formed with an inclined plane which corresponds with and works upon an inclined plane placed upon the end of the pivoted arm opposite to that which forms the fulcrum of the short lever. By moving the set screw in the slot, the longitudinal bar is caused to turn upon its axis and act upon the inclined plane on the pivoted arm, and thus alter the position of the fulcrum of the short lever.

Instead of the longitudinal bar being made to turn upon a pivot, it may be so mounted as to be capable of a to-and-fro motion.

The second part of this invention consists in the method of hingeing or jointing the bed plate of sewing machines to the stand or table. Two pins with enlarged heads are pin-jointed to one side of the bed plate, and pass into holes formed in the stand, the enlarged heads preventing them from entering too far. Underneath the bed-plate and in front of the pins two elastic cushions are placed upon which the machine rests when lowered into working position, the contact of the bed-plate with the cushions raising the heads of the pins from the stand, thus disconnecting the hinge therefrom.

The third part of this invention consists in forming or attaching to the slide or carrier of sewing machines a projecting boss, in which is bored a hole horizontally with the shuttle, and in which hole one end of a bar forming the picker is passed and secured and regulated by a set screw. The other end of the bar is bent to a suitable curve to accommodate the end of the shuttle.

A.D. 1875, January 29.—No. 351.

WEATHERBY, CHARLES PIERRE NEWTON, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London.—"Imprvoed processes and apparatus for manufacturing ice, cooling buildings, and other cooling or refrigerating purposes."

My invention relates, first, to the production of cold by a peculiar method and apparatus by which atmospheric air is compressed, cooled, and expanded more effectually than heretofore. It is desirable in making ice according to the second part of my invention to reduce the air passing through the ice-box or refrigerator to as low a degree as possible. In carrying into practise this part of my invention I use apparatus or machinery comprising a steam cylinder, various force pumps, water jet pumps expansion power cylinders worked by compressed air, an ice chamber containing near the centre a water vessel [*in which the water is frozen, and a graduated vessel*[*]] to supply water to the said ice box. I modify my invention by combining the cooling effect produced by the alternate compression, cooling, and evaporation of a liquid having a low boiling point, or of a condensible gas, and the cooling effect produced by the alternate compression, cooling, and expansion of atmospheric air.

A.D. 1875, January 30.—No. 352.

BROWN, Michael Henry, of New Cross, in the county of Kent.—" Improvements in the construction " of fire guards, and method of adjusting the same to or in front of the fire places of public or private " buildings."

The features of novelty of this invention consist:—

In permanently connecting a fire guard to the chimney piece or to the upper part of the stove or the inside of the fender thereof, and making the said guard of a sheet of wire gauze or chain work capable of being wound round a spring roller so to be drawn down in front of the fire, or in adapting a kind of venetian blind which may be lowered and raised as desired, also in adjusting the guard to the front of a fender so as to roll, or fold, or slide up and be concealed from view when not required to be used, and when required to be capable of being unrolled or unfolded and raised up and supported in that position by suitable means.

A.D. 1875, January 30.—No. 353.

HARGREAVES, Henry Edward, of Rio de Janeiro, in the Empire of Brazil, but at present of No. 12, Fenchurch Street, in the city of London.—" Improvements in the means and apparatus for indicating " the speed of ships."

This invention relates to electric logs, wherein the revolutions of the vanes of the log cause an electric current to be passed at certain intervals along a conducting wire passing from the log to a recording instrument on board ship. According to the present improvements, the revolutions of the screw vanes effect the rotation of a worm and worm wheel, on which is a stud that at every revolution of the wheel causes a contact spring to close an electric circuit comprising a battery and a recording instrument on board ship. The recording instrument is an ordinary morse receiving instrument, the paper strip being marked with divisions representing hours and minutes, so that the number of divisions occurring between two marks made on the paper by the passing of two consecutive currents will indicate the time in which the vessel traversed the distance corresponding to one revolution of the worm wheel of the log.

A.D. 1875, January 30.—No. 354.

MOORE, Alfred, of Fitzroy Works, Euston Road, in the county of Middlesex, and **MOORE**, Arthur Charles, of No. 21, Mount Pleasant, Waterloo, near Liverpool, in the county of Lancaster.—" Improvements in the means of securing sheet metal roofing."

This invention consists in securing the upper ends of the plates of sheet metal roofing by screws passing through slotted holes, while the lower overlapping end of the next plate above is held underneath a lip on a curved clip secured by the same screws that hold the lower plate. Thus each plate being fixed by screws at the middle of its length is free to expand and contract at the upper and lower ends.

A.D. 1875, January 30.—No. 355.

TODD, Leonard Jennett, of Leith, in the county of MidLothian, North Britain, road-locomotive engineer.—" Improvements in locomotive carriages for tramways or common roads, and in steam power " apparatus for the same, and applicable otherwise."

This invention relates to improved arrangements of self-propelling tramway or common-road carriages designed to be worked by means of steam generated in stationary boilers, and stored in receivers attached to the carriages; and it comprises various improvements in the motive-power apparatus that are also applicable when such apparatus is operated for any purpose by steam applied in the ordinary

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[*] The words "in which the water is frozen, and a graduated vessel" are found in the copy of the Abridgment delivered by the Applicant, but do not appear in the original Abridgment.

way. In one improved arrangement two cylindrical (or for the most part cylindrical) metallic vessels or receivers are placed side by side longitudinally beneath the floor of a tramway carriage or omnibus, and at each outer side near one end, there are fixed a cylinder and piston, the two being arranged to drive two coupled pairs of wheels. In a second arrangement or modification of the locomotive carriage three single acting engine cylinders with pistons are embedded in the receivers (of which there may be one, two, or three longitudinally arranged, or a greater number transversely arranged), and the pistons are connected to a crank shaft placed transversely at the end of the carriage, and connected by coupling rods to the wheel axles. When the improved carriage is to be used on steep inclines, or for traction purposes, it is provided with one or more wheels having rubber tires which are by preference applied in a simpler and less costly manner than heretofore being put on in segments which are formed with lateral ribs or projections for securing on the wheel frame by screw bolts, and being made with a lateral enlargement at the tread to retain the metal shoe bars without these requiring any special fastenings.

A.D. 1875, January 30.—No. 356.

WIGHAM, John Richardson, residing at Capel Street, in the city of Dublin, gas engineer.—" Improvements in fog and other signals."

This invention relates to apparatus for producing audible signals known as a " siren." According to the present improvements a combination of two or more revolving discs are used, having an unlike number of apertures on which jets of steam, air, or gas are made to act, so as to produce sounds of more than one note. Or one disc only is used with apertures of different sizes. The apparatus is worked by steam, air, or carbonic acid gas or electricity, which is made to turn the same to every part of the horizon at the same time that it produces the sound. The cutting off or turning on of the steam or other agent is effected automatically.

A.D. 1875, January 30.—No. 357.

EDWARDS, Edmund, of the firm of Edwards and Co., 38, Southampton Buildings, Chancery Lane, in the county of Middlesex, engineers and patent agents.—(*A communication from Ernest Edwards, of Boston, Massachusetts, United States of America.*)—" Improvements in the manufacture of rollers used " in the manufacture of textile fabrics, and for other purposes."

This invention consists in coating rollers used for the purpose of preparing cotton or other fibres, or for other purposes, with gelatine dissolved in water, and with or without the addition of substances tending to render it insoluble, and other substances described.

A.D. 1875, January 30.—No. 358.

STOCKLEY, Joseph, of Sunderland, in the county of Durham, engineer.—" Improvements in apparatus " for the prevention of priming in steam-boilers."

The mixed water and steam passing from the boiler to the engine are more effectually separated by increased centrifugal action caused by its being made to pass between six or more spiral webs or dividing plates, each with a full turn, by which means the separated water will receive a twirling motion and be returned downwards to the boiler, while the separated steam will pass upwards through a central tube to the engine.

A.D. 1875, January 30.—No. 359.

WETTON, Charles Edgar, of 9, Upper Baker Street, Regent's Park, in the county of Middlesex.— " Improvements in boots and shoes."

The novelty consists in inserting between the welt and the outer leather sole a layer of gutta percha or india rubber with magnets on the side thereof nearest to the feet of the wearer.

A.D. 1875, January 30.—No. 360.

LAMBERT, Charles, of Sunk Island, Hull, in the county of York.—" Improvements in filters or " apparatus intended chiefly to clear rain water during its flow from roofs to reservoirs."

The apparatus consists of an outer casing attached to the wall of the building, within which is an inner vessel into which the water is led. The upper part of the inner casing has holes through which the water passes into a filtering medium held between perforated plates through which it passes to a reservoir.

A.D. 1875, January 30.—No. 361.

TAVERNIER, Louis Ferdinand, and MATHESON, John Pyper, of the Perseverance Mills, Dewsbury Road, Leeds, in the county of York, patent coactile cloth manufacturers.—" Improvements in the " manufacture of felted fabrics, and in the production of mixed colours in felted fabrics by cheap and " simple processes."

This consists, 1st. In combining natural dark colour wool, or a dark dyed coloured wool with a natural light colour wool and mixing the two intimately by the carding process. The wools in the mixed state are then felted and dyed. The result is a mottled or a mixed colour appearance.

2ndly. In dyeing a webbing, say black; and by hardening and felting, producing an implantation of white wool through and into the black, thus obtaining a fabric which is, say, white one side and grey the other. This fabric when dyed is reversible.

A.D. 1875, January 30.—No. 362.

HILL, John, and HEY, John Edwards, both of Halifax, in the county of York, ventilating engineers. —" Improvements in ventilators."

This invention relates more particularly to that class of ventilator known as " Watson's syphon ventilator in which a diaphram or diaphrams are employed for separating the "shaft" and conical or other top part or hood into two parts, one for the egress of foul air, and the other for admitting a supply of fresh pure air; but it is also applicable to " single-tube" ventilators. The object of our improvements is to so construct the " cowl" or head of the ventilator that down draft resulting from the force of wind acting on the ventilator may be avoided or reduced to a minimum, and the fresh air regularly introduced without reducing the ventilating capacity of the shaft of the ventilator, and dispensing with the use of a shield or deflecting plate suspended under the mouth of the ventilator below the ceiling, which besides interfering with the efficacy of the ventilator is unsightly in appearance.

A.D. 1875, January 30.—No. 363.

HARRISON, Charles, of St. George's Road, Southwark, in the county of Surrey.—" Improvements " in the construction of runners for umbrellas."

The runner is formed of two or more separate lengths of tube capable of sliding over each other in a telescopic manner. To one end of the runner the collar to which the stretchers are attached is connected, and at the other end of the runner, or at any convenient part thereof, is placed a collar or " tip-cup " for the reception of the tips of the ribs when the umbrella is closed.

A.D. 1875, January 30.—No. 364.

BRADSHAW, Joseph Betts, of Clough Hill House, Rotherham, in the county of York.—" Improvements in machinery for splaying and bending hoops for casks."

According to this Provisional Specification the top splaying roller has inclined or spiral grooves formed upon it.

The bending roller which is set in front of the pair of splaying rollers is conical, and its axis can be inclined so that it may be so set that the hoop may rest flat against it.

A guard is fixed over the splaying rollers to prevent the metal passing through a second time, and to throw the hoop forward out of the machine.

A.D. 1875, January 30.—No. 365.

DOULTON, James, of High Street, Lambeth, in the county of Surrey.—" Improvements in stoves or " fire places."

This Provisional Specification describes dividing the ordinary chimney recess into which the stove or fire grate is fixed by two vertical partitions into three chambers. The two outer chambers are closed in at the front, the central chamber is open at the top to the chimney, and is closed in at the front to within about twelve inches of the hearth upon which the fire is lighted. A damper is introduced, below which are side openings into flues, which are led downwards in the two side chambers, and then upwards to enter the chimney above the damper. Air is admitted to the side chambers, and after being warmed escapes into the room. Close stoves may also be constructed with ascending and descending flues within a casing, to which fresh air may be admitted and then allowed to escape to the room.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 24 to July 30, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, February 1.—No. 367.

CLEMENTS, JAMES MOORE, of Birmingham, in the county of Warwick, sewing machine manufacturer. —"Improvements in sewing machines, embroidery stitches, apparatus, treadles, and in means of " controlling the same when in action."

Firstly. This invention consists in making the driving wheel of a sewing machine fast or loose at will by clutches, pins, or balls and slots, to fix the driving wheel when driven in the right direction, liberate it when reversed, to make it automatic in using the winder without running the machine.

Secondly. Producing a new or improved embroidery stitch with a sewing machine, and making a looper, working above or underneath the fabric, forming new fancy work in connection with sewing, and the forms of looper for different machines.

Thirdly. An improved plait carrier for folding plaits in material being sewn.

Fourthly. An improved friller, the frill being uppermost.

Fifthly. A new silent self acting feed.

Sixthly. A new workholder and guide.

Seventhly. Making stands in combinations of wrought and cast iron; ornamenting them with brass, silk, and other material.

Eighthly. Actuating the machine by the foot without the intervention of the crank motion in such a way that the machine will always turn in the right direction.

Ninthly. A belt guide and apparatus to prevent the machine turning backwards.

A.D. 1875, February 1.—No. 370.

STARK, WILLIAM, manager of Bleach Works to Messieurs John and Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain.—" Improvements in apparatus for breadthening " and drying woven or other web fabrics."

In carrying out the invention, the breadthening is effected by passing the fabric between a pair of counterpart circularly grooved rollers, the ridges of which enter more or less into each others grooves. A pair of the grooved rollers are introduced at any suitable part of a series of steam cans, that is, of hollow cylinders heated by steam, and the grooved rollers are themselves by preference constructed and fitted like the steam cans for the admission of steam into them to assist in the drying action.

A. D. 1875, February 1.—No. 371.

HODSON, CALEB, of Wolverhampton, in the county of Stafford, manufacturer.—" An improved floor, " sash, and bench cramp."

I provide the usual driving screw which works in a frame of ordinary construction, except that the customary slot for the insertion of a spanner is dispensed with as in my invention none is required.

At the back of the frame are placed the two eccentric rollers which are to give the double grip before spoken of, and the joist being placed between them, they are brought together by one or both of the said rollers being turned by a handle or by other convenient means.

The improvement in the slide of the frame before mentioned consists substantially in providing a slot or groove in the said frame in which the slide may be free to travel, and this in a more convenient manner than formerly.

A.D. 1875, February 1.—No. 372.

HUGHES, Henry, of Leicester, in the county of Leicester, mechanical engineer.—" Improvements in " steam engines."

My invention relates more particularly to double cylinder steam engines of the class described in the Provisional Specification filed by me November 3rd 1874, No. 3787, and November 19th 1874, No. 3976, respectively; and consists of an improved arrangement of the valves and of the gear or apparatus connected therewith, whereby the number of joints and bolts required in a double cylinder engine is considerably diminished, the length of the ports is reduced to a minimum, and great simplicity in the mechanism for regulating the speed of the engine is obtained.

A.D. 1875, February 2.—No. 380.

WILKINSON, John Feather, of Leeds, in the county of York.—" Improvements in obtaining motive " power."

This invention is intended for the purpose of utilizing the force and power of the tide, and securing an uniform and continued rotary motion from its action in rising from low water into any given reservoir, lake, river, stream natural or artificial, and on its return therefrom.

A.D. 1875, February 2.—No. 381.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from William Adamson, of Philadelphia, Pennsylvania, United States of America.*)—" Im" provements in the treatment of farnaceous substances for the manufacture of starch and fermented " and distilled liquors."

The essential features of this invention consist in preparing farinaceous substances for conversion into starch, beer, or alcohol by subjecting them to the action of heated hydro-carbons or hydro-carbon vapor under heat and pressure.

A.D. 1875, February 3.—No. 395.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Bogle, of Melbourne, Victoria, merchant.*)—" Im" provements in machinery for brushing boots and shoes, and for polishing, grinding and sharpening " cutlery."

I first provide a framing which supports two horizontal shafts, the lower shaft has a crank and treadle and a fly wheel; the upper one has a small pulley directly over the fly wheel, a belt from which drives it. At the opposite end of the said pulley are two circular brushes, one is the cleaning brush and the other the polishing brush; the boot or shoe is fitted with an elastic last to keep it to the brush.

A.D. 1875, February 3.—No. 409.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Emile Aimé Alexandre Làmarre, of Paris, in the Republic of France, chemist.*)—" Im" provements in the application of combustible compositions to signalling and illuminating purposes, " and in the apparatus employed therein."

This invention relates to the application of combustible compositions (more particularly of the description for which Letters Patent were granted to me on behalf of the said Emile Aimé Alexandre Lemarre, January 16, 1874, No. 214) to buoys or other similar floating bodies for the purpose of signalling and giving light; and it consists of a peculiar construction and arrangement of apparatus for containing the combustible composition to be applied to a buoy or other floating body, and of means employed in combination therewith, whereby such combustible composition is securely retained in the apparatus, until the signal or light is required to be emitted and is ignited at the desired time from any required distance, when it will continue to burn and emit light for a given period varying with the description and quantity of the composition and materials employed.

A.D. 1875, February 5.—No. 446.

STOKES, William Henry, of Birmingham, in the county of Warwick, manufacturing jeweller.—" Improvements in brakes for railway and other carriages, wagons, and trucks."

According to this invention each axle of the carriage has two discs upon it which bear respectively against the faces or tyres of the wheels. The said discs are capable of a slight sliding motion on the axle, but are incapable of a rotatory motion. On the underside of the carriage, arms or levers are jointed. These arms or levers turn in a horizontal plane, and are connected at their inner ends to a sliding rod extending under the middle of the carriage. The outer ends of the arms or levers are provided with two strong brake blocks, one on one side and the other on the other side of the axle. When the sliding rod is pushed home in either direction it gives motion to the arms or levers and causes the brake blocks in one or other side to act upon the discs and the latter to press with great force upon the inner faces of the wheels or tyres, and thereby to bring the wheels quickly to rest.

The arrangement described is applied to each pair of wheels of the carriage, and by connecting the ends of the sliding rods together in making up a train the guard can from his van simultaneously apply the brake power to all the wheels of the train.

A.D. 1875, February 5.—No. 447.

POUNSETT, Rothwell, of Milton House, Lindfield, in the county of Sussex.—"Improvements in the " manufacture of vinegar, and in apparatus to be used in the said manufacture."

This invention consists in causing the air to pass on its way to the acetifying vats through refrigerating apparatus containing purifying and filtering materials.

A.D. 1875, February 6.—No. 462.

WEBB, Francis William, of Crewe, in the county of Chester, engineer.—"Improvements in mechanism " or arrangements for actuating railway points and signals."

This invention has reference mainly to improvements in those combinations and arrangements of mechanism for actuating railway points and signals described in the Specification of a Patent granted to the petitioner, No. 442, A.D. 1874, and consists in an improved construction and combination of mechanism which will effect the required locking, unlocking, and "back-locking," and at the same time prevent the signal or point lever handles from being tampered with, or used out of their proper order.

One modification consists in forming a cam groove in the head of the hook bar d described in the Specification of the petitioner's said Patent No. 442, A.D. 1874, and in arranging a lever of the first order on a fulcrum pin in the centre part of the lever handle, and in connecting this lever with the rod from the catch weight, so that on lifting the catch weight out of its notch in the quadrant, the lever by a projection upon its side fitting the cam groove in the said bar *d* will lift the bar (d) and when the lever handle is pulled over, the said lever will be carried forward in he cam groove, so that on the catch weight being lowered into the other notch in the quadrant, one end of the lever will descend, but the other end will ascend, lifting the said [bar d a second step. The ordinary stops are used with this apparatus as described in the petitioner's said Specification, but for back locking only a single stop is used and not two stops, as described in petitioner's said Specification.

By another modification, petitioner makes the catch to enter a notch in the upper side of the quadrant, in one position of the lever handle and to enter a notch in the under face of the quadrant in the other position of the lever handle, the catch weight being forced into the latter position by a weight lever on the quadrant frame, against an arm of which the under side of the catch comes when the lever handle is pulled over.

The invention further consists in mechanism to be added to that described in petitioner's said Specification for actuating points and signals to prevent such mechanism from being wilfully tampered with or used out of its proper order, in the case of lever handles which have to be "back-locked," and consists in applying catches or shafts or sliding bars with notches, so as to lock or release by the bars d actuated by connection with the centre part of the lever handles, so that these catches or sliding bars are only actuated to lock or unlock by the "pulling over" or pushing back of the lever handles; this locking and unlocking being supplementary to that performed by the movement of the "catches" that enter the notches in the quadrants and described in the Specification of the petitioner's said Patent.

Another modification consists in the use of crank pins, excentrics, cams or cam slots in connection with the handles upon the lever handle to actuate directly both the quadrant catch and bar *d*. Such handle being in one extreme of its arc of movement when the quadrant catch is in one notch and at the other extreme when the catch is in the other notch of the quadrant.

A.D. 1875, February 20.—No. 634.

SMITH, James Henry, of Albion Works, Lansdowne Road, London Fields, in the county of Middlesex. —"Improvements in sewing machines."

This invention relates to improvements in the presser, take up, shuttle and its carriage, feed and loop catch of lock stitch sewing machines, and adjustable automatic embroidery designer for use either in lock-stitch, chain stitch and other sewing machines. The presser is held down by a flat blade spring, the take up is effected by a lever worked by a cam; the shuttle is provided with a spring hook for taking up slack of the under thread, and its carriage is fitted with a lever for holding down the shuttle or for throwing it up by hand, the said lever operating as a retarder of the loop passing over the shuttle when the machine is used for chain stitch. The four motion feed is worked by a vertical and horizontal lever jointed together, the vertical lever being moved by a crank and having a fulcrum that can be shifted to vary the feed. A loop catch is provided to enter the bulge of the needle thread in front of the shuttle, rendering a pause of the needle unnecessary. An adjustable designer is provided consisting of two arms or springs with points, which are made alternately to enter into holes in the cloth plate on each side of the presser foot, which points form pivots for the work to turn upon; both points are capable of being lifted clear and the work proceeded with straight forward; a guide is provided for indicating the distances to be traversed.

A.D. 1875, July 26.—No. 2649.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Augustus Corey Richards, a person resident in the city, county, and state of New York, United States of America, merchant.*)—"Certain new and useful improvements in type setting machines."

This invention consists in an endless apron in combination with converging guides, and with a series of type channels from which the desired types are discharged successively by suitable mechanism in such a manner that by the combined action of the carrying apron and the converging guides the types are deposited in the proper position in a channel provided for their reception.

A.D. 1875, July 27.—No. 2657.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from David Rousseau, of the city, county, and state of New York, United States of America.*)—"Improvements in circuit closers for electric railway signalling apparatus."

The object of this invention is to utilize the proportionate elasticity of railway rails in connection with the weight of trains passing over the same, for the purpose of establishing electrical connection for operating suitable signals.

A.D. 1875, July 27.—No. 2662.

HASKELL, Asa Green, of the state of Massachusetts, of the Republic of the United States of America.—"A new and useful life preserving bed."

This Complete Specification describes an article, which not only answers as a bed or elastic seat for a person to repose or sit upon, but as a life preserver, it being intended for use on ship-board and for the saving of life and property in case of ship-wreck or foundering of a vessel at sea, or of a person accidentally falling overboard.

It is composed of a floatable body and series of inflatable cushions hinged together and provided with a series of pipes or conduits for inflating the cushions; and furthermore it has a series of straps applied to it.

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 32 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 5 with the weekly Nos. of the Index for the present year.]

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——— W., & Johnson, S., 191, Jan. 18, Heating feed- [water; condensing steam.
Allen, W., 269, Jan. 23, Raising and forcing fluids.
Allibon, G., Manbré, A., & Beldam, W. A., 264, Jan. 23, [Steam-boilers.
Alston, W., 171, Jan. 16, Adjustable chairs, &c.
American Sewing-Machine Co., Hamburg- (Jensen), 26, [Jan. 22, Printing metals.
Ankers, J., 2593, July 21 (*App.* 4.) Lubricating axles.
Antisell, T. M., & Bruce, De V., 2016, June 16 (*App.* 49.) [Vapor and gas-engines.
Armstrong, J., 142, Jan. 14, Railway switches.
Arnold, L., & Kidd, J., 66, Jan. 7, Gas.
Aspinwall, E. O., 249, Jan. 22, Candle and lamp wicks.
Atkin, R., 92, Jan. 11, Life-boats, rafts, &c.
Aubertin, E., Boblique, L., Leplay, H., & Box, J., 181, [Jan. 16, Phosphates and phosphorus.
——— E., Boblique, L., Leplay, H., & Box, J., 214, [Jan. 20, Disinfecting sewage, &c.
Aylesbury, H., 262, Jan. 23, Bottle stoppers.
Ayton, P. E., 84, Jan. 9, Attaching knobs to spindles.

B.

Badcock, J., 280, Jan. 25, Ladies' dress improver.
Baffoy, P, H., Dupré, P. S. E., Rogé, H. N., & Poret, E. (Clark), 288, Jan. 25, Preserving woven fabrics.
Baillie, R., & Westwood, J., 341, Jan. 29, Corrugated [iron plates.
Baird, J., & Brown, J. F., 258, Jan. 23, Weaving.
Baker, D., 1577, Apr. 29 (*App.* 44.) Mariners' compasses.
——— J. M. B., 86, Jan. 9, Drying steam-boilers.
——— R., 62, Jan. 7, Jacquards.
Baker, W., 327, Jan. 28, Purifying iron.
Balestrieri, P. (Clark), 89, Jan. 9, Collecting rays of [light and heat.
Bannister, R. D., & Milligan, S. (Lake), 2245, June 18 [(*App.* 51.) Device for advertising.
Bañolas, R. (Johnson), 138, Jan. 13, Extinguishing fires.
Barker, A. (Alexander), 1633, May 3 (*App.* 45.) Railway [breaks.
Barron, W. S., & Britten, F. J., 118, Jan. 12, Centrifugal [apparatus.
Bates, F. L. (Clark), 1639, May 3 (*App.* 45.) Locking [screw nuts.
Bayliss, M., & Jones, E., 174, Jan. 16, Nuts and washers.
Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Beck, J., & Blakeborough, R., 227, Jan. 20, Hydrants [and fire cocks.
Beldam, W. A., Allibon, G., & Manbré, A., 264, Jan. 23, [Steam boilers.
Bennett, F. G., 168, Jan. 15, Roller skates.
Benson, M. (*Redheffer*), 388, Feb. 3 (*App.* 32.) Freezing, [churning, &c.
——— M. (*Williams*), 437, Feb. 5 (*App.* 32.) Boots [and lasts.
——— M. (*Wicks*), 1199, Apr. 2 (*App.* 40.) Pattern [chains for looms.
Benwell, R., & Humphreys, G. (Alexander), 196, Jan. 19, [Bale bands.
Bewsher, J., 339, Jan. 28, Printing.
Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.) [Burning bricks, &c.
Binns, L., 335, Jan. 28, Mounting driving bands of [machinery.
Blain, J., 278, Jan. 25, Fire extinguisher.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Blake, L. R., & Gardner, C. F., 206, Jan. 19, Boots [and shoes.
Blakeborough, R., & Beck, J., 227, Jan. 21, Hydrants. [and fire-cocks
Blot, A. (Vaughan), 37, Jan. 4, Presses.
Bluck, E., 72, Jan. 8, Railway carriages.
Boblique, L., Leplay, H., Box, J., & Aubertin, E., 181, [Jan. 16, Phosphates and phosphorus.
——— L., Leplay, H., Box, J., & Aubertin, E., 214, [Jan. 20, Disinfecting sewage, &c.
Bogle, A. (Lake), 395, Feb. 3, (*App.* 5.) Brushing boots [and shoes; polishing, &c.
Bohlken, A. (Jensen), 295, Jan. 26, Washing machine.
——— *A.* (Jensen), 307, Jan. 27, Earth-boring augers.
Bois, A., 45, Jan. 5, Safety guard for tram-cars, &c.
Bonnefond, A., 46, Jan. 5, Water meters.
Bonner, J., 11, Jan. 1, Weaving.
Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
——— H.A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens

Bonneville, H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro-
[magnetic telegraphs.
——— H. A. (*Richards*), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Bontemps, P. (Clark), 99, Jan. 11, Hydrostatic motor.
Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.)
[Sewing machines.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27, Railway signalling.
——— M. P. W., 96, Jan. 11, Hot gas & steam engines.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
——— G. T. (*Société Anonyme du Cuivre Français*),
[2042, June 3 (*App.* 49.) Protosulphuret of
[iron and sulphuretted hydrogen gas.
——— G. T. (*Société Anonyme du Cuivre Français*),
[2084, June 5 (*App.* 50.) Kilns or ovens.
——— G. T. (*Kohrig & Pzillas*), 2486, July 10
[(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, har-
[ness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181,
[Jan. 16, Phosphates and phosphorus.
—— J., Aubertin, E., Boblique, L., & Leplay, H., 214,
[Jan. 20, Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro-
[magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish-
[ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9
[(*App.* 33.) Filling and corking bottles.
Bradley, G., & Madderson, T., 63, Jan. 7, Crushing
[stones, &c.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining powder.
Briebach, J. A., 313, Jan. 27, Indicating position of
[rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
——— J., F. W. & W. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
——— W. W., J. & F. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal
[apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F. P.,
[76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking
[apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing
[electro-type shells.
Brown, J. F., & Baird, J., 258, Jan. 23, Weaving.
——— M. H., 352, Jan. 30, Fire guards.
——— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and
[windows.
——— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
——— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
——— W. Morgan- (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of type.
——— W. Morgan- (*Johnson & Harding*), 2250, June 19
[(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12,
[Converting iron scraps, &c. into steel.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29,
[Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.)
[Vapor and gas-engines.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning
bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway car-
[riages; tyres.
Bustin, R. (Lake), 185, Jan. 18, Hanging wall papers.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18, Casks.
——— T., & Thornley, G., 1518, Apr. 26 (*App.* 44.)
[Jointing cask staves.

C.

Cadogan, Hon. G., 328, Jan. 28, Apparatus for igniting
[and holding matches.
Cannon, W. G., 294, Jan. 26, Cup and ball joint for gas
[pendants, &c.
Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casson, T., 123, Jan. 13, Hydraulic engines.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
Cave, J. O'C., 140, Jan. 14, Aërial navigation.
—— J. O'C., 141, Jan. 14, Governor, steam gauge,
[safety valve, &c.
—— J. O'C., 571, Feb. 17 (*App.* 34.) Rest for knives,
[forks and spoons.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chameroy, E. A., 417, Feb. 4 (*App.* 1.) Cocks for water,
[steam, &c.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H.
(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing
[machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket
[eyes on tools.
Chaquette, E., 416, Feb. 4 (*App.* 32.) Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas,
parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from
[fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Chivers, A. & S., 349, Jan. 29, Concentrating sulphuric
[acid.
——— S. & A., 349, Jan. 29, Concentrating sulphuric
[acid.
Clark, A. M. (*Portait & Weber*), 28, Jan. 2, Preparing
[fibres for spinning.
——— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
——— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of
[light and heat.
——— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
——— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting
[hats, &c.
——— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial
[apparatus.
——— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for
[nut blanks.
——— A. M. (*Eyquem*), 256, Jan. 22, Steel.
——— A. M. (*Rogé, Poret, Baffoy, & Dupré*), 288,
[Jan. 25, Preserving woven fabrics.
——— A. M. (*Robinson*), 338, Jan. 28, Feeding and
[burning oils in furnaces.

Clark, A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.
—— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery [and handles.
—— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking [screw nuts.
—— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.* [46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway [for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro- [magnetic engines.
—— A. M. (*Lodge*), 2520, July 13 (*App.* 3.), Fulling [mills.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— W., 80, Jan. 9, Railway breaks.
—— W. (*Rousseau*), 2657, July 27 (*App.* 5.) Railway [signalling.
Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8, [Bricks, tiles, &c.
Clements, J. M., 367, Feb. 1 (*App.* 5.) Sewing-machines.
Cleveland Paper Box Machine Co. (Haseltine), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
Clough, W. R. (Haseltine), 1640, May 3 (*App.* 45.) Cork- [screws.
Coales, S. L., 334, Jan. 28, Coiling and uncoiling hose [pipes.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and [windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers [and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Connell, A., 302, Jan. 26, Wagons.
Coombe, J. C., 287, Jan. 25, Blacking.
Constant, J. (Johnson), 301, Jan. 26, Connecting tubes [to tube plates.
Cornely, E. (Gedge), 306, Jan. 27, Edging machines.
Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, W., & Howard, J., 277, Jan. 25, Saddle girth [tightener.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy- [menageries.
Crocker, S. L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
—— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Cuivre Français, Société Anonyme du (Bousfield), 2042, [June 30 (*App.* 49.) Protosulphuret of iron [and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.* 50.) Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary [vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti- [lating water-closets, &c.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
Deacon. H., 332, Jan. 28, Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or [aërial apparatus.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.) [Sewing machines.
Deverell, S. R., Deverell, W. T., & Tower, B., 308, [Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308, [Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and [stuffing box.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H. [(Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8, [Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677, [May 5 (*App.* 45.) Paddle wheels.
Edwards, Edmund (*Boullenot*), 75, Jan. 8, Safety lamps.
—— Edmund (*Edwards*), 357, Jan. 30, Rollers for [fabrics.
Edwards, Ernest (Edwards), 357, Jan. 30, Rollers for [fabrics.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Espir, C. (*Le Bricquir*), 291, Jan. 26, Mining powder.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or [aërial apparatus.
Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farris, W. H. (Lake), 310, Jan. 27, Water circulating bars.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c. fibres.
—— W. & J., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9 [(*App.* 33.) Filling and corking bottles.
Fewster, W., 293, Jan. 26, Saving life and property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air [engines, &c.
Fitz, E. E., 187, Jan. 18, Mounting globes.

Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flagler, H. K. (Hunt), 290, Jan. 26, Welding tubes, &c.
Fliteroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing-
[machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
Fouillon, J. (Maes), 331, Jan. 28, Gloves.
Foundries & Forges Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Fox, G., & J. H., 309, Jan. 27, Finishing woollen fabrics.
—— J. H. & G., 309, Jan. 27, Finishing woollen fabrics.
Foxwell, D., 282, Jan. 25, Shaping wire.
France, W. H., 104, Jan. 12, Combing wool, &c.
Francis, G. W., & Brownlow, D. R. (Lake), 340, Jan. 29,
[Coating for metals.
Friedlander, J., & *Jachimovicq, C.*, 266, Jan. 23, Collect-
[ing crops.
Furrell, E. W. (*Browne*), 241, Jan. 21, Stand for charts, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele-
[graphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for
[wood, &c.
——— M., 173, Jan. 16, Railway wheels.
Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots
[and shoes.
——— S., & Rees, E., 320, Jan. 28, Fire bars.
Garland, H. P., 229, Jan. 21, Sewing-machines.
——— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish-
[ing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
—— W. E. (*Cornely*), 306, Jan. 27, Edging machines.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Geiger, T., & Niemann, G. (Hildebrandt), 316, Jan. 27,
[Tramways.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.
Gill, D., 268, Jan. 23, Deodorising sewer gases.
—— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer
[gases.
Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling,
[&c. beer.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
——— W. & G, 179, Jan. 16, Railway signalling.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
—— W., 129, Jan. 13, Soaps.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Haggas, W., 285, Jan. 25, Looms.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hall, J., 346, Jan. 29, Lime and cement kilns.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.
——— J., 147, Jan. 14, Sulphates.
Harper, R. R., 336, Jan. 28, Electric telegraph apparatus.
Harrison, C., 363, Jan. 30, Umbrella runners.
Harrison, S. L., 461, Feb. 6 (*App.* 33.) Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4 (*App.* 32.) Balanced
[slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.* 33.)
[Filling and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.*
[33.) Rock drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App* 40.) Burning
[bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.)
[Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening
[cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving
[bed.
Hayward, G., Knap, C., & Taunton, R. H., 208, Jan. 19,
[Wrought iron tubes.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10 (*App.* 33.) Horse-shoe & other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Hildebrandt, A. (*Niemann & Geiger*), 316, Jan. 27, Tram-
[ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Higginson, A., 108, Jan. 12, Motive-power engines and
[pumps.

Hobbe, A. C., & Orcutt, J. (Brookes), 125, Jan. 13,
[Cartridges.

Hodson, C., 371, Feb. 1 (*App.* 5.) Floor, sash, and bench
[cramp.

Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.

Holland, W., & *Myers, H.*, 34, Jan. 4, Umbrellas and
[parasols.

Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing
[machinery.

Holmes, R. R., 122, Jan. 13, Aërated liquors.

Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.)
[Steam-boilers.

Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other
[articles.

Hough, J. E., Rimington, J. McN., Shepherd, E., &
[Rothwell, F. & T., 350, Jan. 29, Sewing-
[machines.

Howard, J., & Cox, W., 277, Jan. 25, Saddle girth
[tighteners.

Howarth, A. & W., 322, Jan. 28, Dental lathes, &c.

——— J., 240, Jan. 21, Hot-air stoves.

——— W. & A., 322, Jan. 28, Dental lathes, &c.

Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop-
[pering bottles, &c.

Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.

—— E. T. (*Parker*), 61, Jan. 6, Claw hammers.

—— H., 372, Feb. 1 (*App.* 5.) Steam-engines.

Humble, W., 149, Jan. 14, Life boats.

Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19,
[Bale bands.

Hunt, B. (*Flagler*), 290, Jan. 26, Welding tubes, &c.

— E. (*Matthews*), 6, Jan. 1, Musical instruments.

Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.

I.

Imlay, C. G. (Lake), 253, Jan. 22, Preventing fraud by
[tram-car conductors, &c.

Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.

Ingram, J. G., 235, Jan. 21, Washers and packing pieces.

Isherwood, S., & Weare, R., 326, Jan. 28, Carbonaceous
[material for filtering, &c.

J.

Jackimovicz, C., & Friedlander, J., 266, Jan. 23, Collect-
[ing crops.

James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.

James, J., 284, Jan. 25, Railway carriages and wagons.

Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.

Jensen, P. (*Hamburg-American Sewing-Machine Co.*)
[26, Jan. 2, Printing metals.

——— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.

——— P. (*Bohlken*), 295, Jan. 26, Washing machine.

——— P. (*Bohlken*), 307, Jan. 27, Earth-boring augers.

Jeyes, J., & Turner, C. H., 205, Jan. 19, Lubricator.

Johnson, G. (Clark), 199, Jan. 19, Rolling bars for nut
[blanks.

Johnson, J. C., 209, Jan. 20, Forming tube skelps.

——— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening
[drills.

——— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer-
[ing, &c.

——— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing
[fires.

Johnson, J. H. (*Constant*), 301, Jan. 26, Connecting
[tubes to tube plates.

——— J. H. (*Adamson*), 381, Feb. 2 (*App.* 5.) Starch,
[&c.

——— J. H. (*Lamarre*), 409, Feb. 3 (*App.* 5.) Sig-
[nalling and illuminating.

——— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.

——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.

Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.

——— *J. R., & Harding, G. P.* (Morgan-Brown)
[2250, June 19 (*App.* 52.) Tramway rolling stock.

Johnson, S., & Allan, W., 191, Jan. 18, Heating feed
[water; condensing steam.

——— S. H., 156, Jan. 14, Cocks or valves.

Joliot, J. P. S., 204, Jan. 19, Railway breaks.

Jolley, W., 172, Jan. 16, Railway signalling.

Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.

—— H., & Davies, J., 248, Jan. 22, Stoppering bottles.

—— H. L., 492, Feb. 10 (*App.* 3.) Disinfectants and
[deodorizers.

—— R. A., & Perry, J. J., 12, Jan, 1, Lighting cigars, &c.

Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.

Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.

Kellogg, H. (Crosby), 324, Jan. 28, Fur coated fabrics.

——— *H.* (Crosby), 325, Jan. 28, Head coverings.

Kendrick, T., 31 Jan, 4, Coffin furniture.

Kennedy, J., & Wigg, C., 314, Jan. 27, Furnaces.

——— W., & Acheson, G., 40, Jan. 4, Spinning.

Kerby, J., 274, Jan. 23, Boots.

Kidd, J., & *Arnold, L.*, 66, Jan. 7, Gas.

Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening
[cotton.

Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.

Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19,
[Wrought iron tubes.

Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.

Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 18,
[Treating and dyeing vegetable textiles.

Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 18.
[Treating and dyeing vegetable textiles.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.

——— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.

——— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.

——— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.

——— W. R. (*Whittemore*), 163, Jan. 15, Spikes.

——— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.

——— W. R. (*McClintock*), 207, Jan. 19, Preserving
[substances.

——— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by
[tram-car conductors.

——— W. R. (*Farris*), 310, Jan., 27, Water circulating
[bars.

——— W. R. (*Brownlow & Francis*), 340, Jan, 29, Coat-
[ing for metals.

——— W. R. (*Bogle*), 395 (*App.* 5.) Brushing boots and
[shoes; polishing, &c.

Lake, W. R.(*Martin*), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-
[menageries.
—— W. R. (*Rogers*), 2045, June 1 (*App.*49.) Smelting
[ores ; making iron; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.)
[Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather
[pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.*51.) Backing
[electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18
[(*App.* 51.) Device for advertising.
Lamarre, E. A. A. (Johnson), 409 Feb. 3 (*App.* 5.)
[Signalling and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing ma-
[chines, &c.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14,
[Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining
[powder.
Lee J., 131, Jan. 13, Fire-arms.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181,
[Jan. 16, Phosphates and phosphorus.
—— H., Box, J., Aubertin, E., & Boblique, L., 214,
[Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway
[sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, G. H., 137, Jan. 13, Cigars.
—— R. T., 237, Jan. 21, Looking glasses and mirrors.
Lloyd, J., & Scully, J., 226, Jan. 20, Drying wall
[papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c.,
[threads ; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing
[slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and
[axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.)
[Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving
[substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Com-
[positions for paving, &c.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c.
[waste products.
Mackay, M., 200, Jan. 19, Compounds for dissolving
[resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing
[instruments.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M.,
[76, Jan. 8, Railway wheels and axles.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing
[stones, &c.
Maes, L. (*Fouillon*), 331, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 19,
[Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscrip-
[tions, &c.
Manbré, A., Beldam, W. A., & Allibon, G., 264, Jan. 23,
[Steam-boilers.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard
[railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Marchant, R. M., 304, Jan. 27, Furnaces.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, J., 162, Jan. 15, Thrashing machines.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted
[fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.*
[44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
—— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.*
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped
[axles.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8
[(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
—— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Mitchell, W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20
[(*App.* 35.) Filtering water.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20
[(*App.* 35.) Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
—— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and
[windows.
—— W. (*Crompton*), 146, Jan. 14, Looms.

Morgan-Brown W. (*Crompton*), 1967, May 29 (*App*. 49.)
[Boiler anti-incrustation battery.
——— W. (*Harding & Johnson*), 2119, June 9
[(*App*. 50.) Writing, &c. by means of
[type.
——— W. (*Johnson & Harding*), 2250, June 19
[(*App*. 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App*. 49.) Flood-
[way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying
[gas for aërial purposes.
Mosman, D. F., 751, Mar. 1 (*App*. 36.) Generating and
[utilizing steam.
Mountford, E. C. & W., 292, Jan. 26, Games.
——— W. & E. C., 292, Jan. 26, Games.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit-
[ting hats, &c.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App*. 42.)
[Sewing-machines.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and
[parasols.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Newbold. E., 267. Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding,
[&c. fibres.
Newton, H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding
[engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27,
[Tramways.
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Nussey, G. H., & Leachman, W. B., 139, Jan. 14, Punch-
[ing and rivetting machines, &c.

O.

Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13,
[Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Outerson, A. & J., 558, Feb. 16 (*App*. 34.) Filters.
——— J. & A., 558, Feb. 16 (*App*. 34.) Filters.

P.

Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine),
[1008, Mar. 18 (*App*. 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Patrick, R., 2499, July 12 (*App*. 3.) Rotary pumps and
[engines.
Payton, W. & Holmes, J. E., 343, Jan. 29, Sawing
[machinery.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces,
[purses, &c.
Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485
[Feb. 9 (*App*. 33.) Rock drills.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drink-
[ing bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App*. 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2,
[Preparing fibres for spinning.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Venti-
[lating water closets, &c.
Pounsett, R., 447, Feb. 5 (*App*. 5.) Vinegar.
Powleson, W. L., 2565, July 17, (*App*. 4.) Steam super-
[heaters.
Pregardan, J. (Hessel), 1636, May 3 (*App*. 45.) Steam-
[boilers.
Price, H., 639, Feb. 22 (*App*. 35.) Oil lamps.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10
[(*App*. 8.) Sugar.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App*. 48.) Sail hank
[or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21, Creased or
[plaited fabrics.
Reckendorfer, J. (Marler), 215, Jan. 20, Pencil cases.
Redheffer, W. (Benson), 388, Feb. 3 (*App*. 32.) Freez-
[ing, churning, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit-
[ting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reid, W., 166, Jan. 15, Sewing machines.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201,
[Jan. 19, Railway signals and points.
——— G. H., 2287, June 23 (*App*. 52) Rock-drilling
[machines.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App*. 5.)
[Type-setting machines.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for
[floors, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., &
[Hough, J. E., 350, Jan. 29, Sewing machines.
Robinson, C. E. (Clark), 338, Jan. 28, Feeding and
[burning oils in furnaces.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14
[(*App*. 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing
[machines, &c.
——— H. (*Mullholland*), 161, Jan. 15, Cut nails.
Rogers, W. (Lake), 2045, June 3 (*App*. 49.) Smelting
[ores ; making iron ; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.

Rothwell, T. & F., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway
[signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and
[forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
Russell, H., 109, Jan. 12, Registering garments, &c.
[sent to laundries.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.
Rydill, G., 150, Jan. 14, Purifying sewage &c.

S.

Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
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3. Appendix to Chronological and Descriptive Index, containing the Abridgments open to public inspection before the expiration of the term of six months, and also the Abridgments of Complete Specifications received from July 24 to July 30, 1875.
4. Index of Names to Chronological and Descriptive Index from January 1 to January 30, 1875, and to Appendixes from January 31 to July 30, 1875.
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CHRONOLOGICAL AND DESCRIPTIVE INDEX OF PATENTS APPLIED FOR AND PATENTS GRANTED,

CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from January 31 to February 6, 1875.

A.D. 1875, February 1.—No. 366.

ELCE, John, of Manchester, in the county of Lancaster, machinist.—"Improvements in machinery "for preparing, spinning, and doubling cotton and other fibres."

My invention consists in an improved back stop motion applicable to drawing frames and other machines that are fed with slivers, slubbings, or rovings; also in imparting a false twist to slivers, slubbings, or rovings as they pass from one drawing roller to another in preparing and spinning machines or from a porcupine roller to a pair of drawing rollers: also in bushing the upper end of the tubes fixed in the copping or lifting rails in which the spindles of machines for preparing spinning and doubling revolve; also in providing for the lubrication of such bushes by means of a spiral groove.

A.D. 1875, February 1.—No. 367.

CLEMENTS, James Moore, of Birmingham, in the county of Warwick, sewing machine manufacturer. —"Improvements in sewing machines, embroidery stitches, apparatus, treadles, and in means of "controlling the same when in action."

Firstly. This invention consists in making the driving wheel of a sewing machine fast or loose at will by clutches, pins, or balls and slots, to fix the driving wheel when driven in the right direction, liberate it when reversed, to make it automatic in using the winder without running the machine.

Secondly. Producing a new or improved embroidery stitch with a sewing machine, and making a looper, working above or underneath the fabric, forming new fancy work in connection with sewing, and the forms of looper for different machines.

Thirdly. An improved plait carrier for folding plaits in material being sewn.

Fourthly. An improved friller, the frill being uppermost.

Fifthly. A new silent self acting feed.

Sixthly. A new workholder and guide.

Seventhly. Making stands in combinations of wrought and cast iron; ornamenting them with brass, silk, and other material.

Eighthly. Actuating the machine by the foot without the intervention of the crank motion, in such a way that the machine will always turn in the right direction.

Ninthly. A belt guide and apparatus to prevent the machine turning backwards.

A.D. 1875, February 1.—No. 368.

SHAW, John, of the Neptune Engine Works, Low Walker on Tyne, in the county of Northumberland. —"Improvements in steam boilers."

According to this invention a steam boiler is constructed of a pair of equal and separate parts or sections. Each section consists of a cylindrical or other shaped casing, in the lower part of which is a cylindrical fire box extending through the section, above which are fire tubes extending through the section.

The two sections are set back to back with an enclosed space between them, into which the flames from the fire-grates of both sections issue and whence they pass into the fire tubes above, issuing into an up-take in the front of each section which may lead into a chimney common to both sections. Both sections communicate with one and the same steam chamber at top by means of pipes provided with shut-off valves.

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A.D. 1875, February 2.—No. 384.

EDISON, THOMAS ALVA, of Newark, in the state of New Jersey, United States of America.—"Im-" provements in duplex and multiplex telegraphs."

This invention relates to improvements in telegraph instruments and circuits, whereby one wire can be used simultaneously by two operators at both terminal stations, one to send and the other to receive, usually known as a duplex telegraph; also one wire can be simultaneously used by two operators to transmit and two operators to receive at each end, called a quadruplex telegraph. A circuit preserving key brings into operation the whole battery or only a portion to operate one set of electro magnetic instruments by the rise and fall of tension. Another key reverses the current without breaking the circuit, and a polarized relay magnet responds to the reversal. Rheostats, condensers, and induction coils are inserted to neutralize static discharges, to equalize and neutralize the action of the currents sent on the receiving instruments at that station, and leave them free to respond to the currents from the distant station, also to establish artificial lines of equal resistance to the main line, and thereby to balance the electrical forces. The polarized relay and differential electro magnet operate by local circuits, the instruments that receive the messages and indicate the same by sound or marks. At intermediate stations the instruments are arranged so as to work to either terminal station, or by connecting them a relay is effected, so that on long lines the operator at a terminal station works a relay at an intermediate station to send to the distant terminal station, and this is used either in the duplex or quadruplex telegraphs.

A.D. 1875, February 2.—No. 385.

NEWTON, ALFRED VINCENT, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Hugo Borchardt, of New Haven, in the state of Connecticut, United States of America.*)—"Improvements in bullet patching machinery."

This invention relates to machines for applying patches to cylindrical bullets, and consists in a certain combination of devices, by the operation of which bullets which may or may not be previously covered with an adhesive substance are automatically seized and rolled across a package of damped paper or strips cut into appropriate shape, so that the exterior strip is taken up by the periphery of each successive bullet as it comes along and wrapped around it.

A.D. 1875, February 2.—No. 386.

GILMORE, The Reverend JOHN, Rector of Holy Trinity Church, Ramsgate, in the county of Kent.—"Improvements in apparatus for turning over the leaves of music."

This invention consists of an arrangement of springs and lever operating rods or guides placed between the leaves of music for the purpose of enabling the performer to turn over the leaves without removing his or her hands from the keyboard.

A.D. 1875, February 3.—No. 387.

STEVENSON, GRAHAM, of Airdrie, in the county of Lanark, North Britain, engineer.—"Improve-" ments in machinery to be used in mining and quarrying; parts of which improvements are also " applicable to steam engines and to air blowing or compressing engines for other purposes."

The first part of the invention relates to the compressing of air by machinery on the surface, such air being conveyed by pipes to the machines in the mine or quarry for excavating or getting the coal or other mineral; and one improvement consists in leading the exhaust air from the working machines back by a second line of piping to the compressing engine. In one modification of the compressing apparatus there are two vertical air cylinders, which with their air casings or receivers form the lower part or base, and so dispense with a large part of the weight of base plates and foundations that are otherwise required. Each compressing piston is worked by four rods passing up through long pipes which serve as guides to a frame head to which are attached one or more rods appertaining to an overhead inverted steam cylinder. The second part of the invention relates to modifications of the steam machinery for pumping water from the mine or quarry. The pump rods are connected to the overhanging ends of two horizontal beams placed one a little below the other. The upper beam is centered at its middle, and its back end is connected to the piston rod of a vertical steam cylinder. The lower beam is centered at its back end, and at its middle it is connected by links to a point of the upper beam half as far behind the centre thereof as its front connection to the pump rod is before that

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- Endless bands for driving, Ramsden, 221.
- Loop expanding mechanism, shuttles for same, Moreau, 228.
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- Joining, making and ornamenting stands for, Clements, 367 (*App.* 5.)
- Driving & controlling when in motion, Clements, 367 (*App.* 5.)
- Plait folder, work holder & silent feed, Clements, 367 (*App.* 5.)
- Friller, band check and treadle; embroidering, Clements, 367 (*App.* 5.)
- Automatic adjustable embroidery designer, Smith, 634 (*App.* 5.)

A longitudinal shaft revolves in bearings suspended from the carriage or truck. To each end is fixed, vertically and on the same axis a plate of metal having projections and recesses for a similar plate, belonging to the carriage abutting, to fit therein, so that the revolution of one shaft shall rotate the adjoining one. To keep the faces of the connecting plates close up to their work, hollow cylinders containing a spring are placed along the line of shaft, thus allowing the shaft to shorten or lengthen as circumstances require. Each set of brakes are connected together by a rod. On the axle of a friction wheel is mounted a vertical drum, around which a chain passes, the two ends being fastened to distant points on the rod. This friction wheel is actuated by a similar wheel placed over the longitudinal shaft. On to this shaft is keyed a bevelled cogged wheel working a similar wheel fastened to the underside of the last-mentioned friction wheel, to which it gives motion when the brake power is applied.

A.D. 1875, February 3.—No. 392.

HUGHES, Seymour, of Islington, in the county of Middlesex, and **TURNER**, James, of Victoria Park, in the county of Middlesex.—" Improvements in lamp burners."

This invention has reference to the construction of mineral oil lamp burners with a view to the more economical development of the illuminating power of the oil or spirit consumed therein, and consists in the combination of two or more circular wick-cases or separate burners placed at a suitable distance from each other so as to produce separate and distinct circular flames, the whole being surrounded by a cone having apertures corresponding in position with the tops of the burners. Exterior to, and above the cone aforesaid, is placed another cone pierced with holes for the admission of air and having similar apertures to the cone first mentioned. Attached to or near the bottom of the burner is a shade holder or gallery with suitable openings or air passages. The wicks may be flat and introduced through curved or semicircular shaped openings at the bottom of the burner, and raised or lowered by the usual pinions or indented wheels.

A.D. 1875, February 3.—No. 393.

HOLLAND, Richard, of Wednesbury, in the county of Stafford, foreman of wheel works.—"Improvements in fastening the tyres of railway wheels."

This invention consists in dispensing with the ordinary piercings in the tyre and the fastening pins and using in place thereof fastening parts constituting portions of the rim and tyre of the wheel. For this purpose equi-distant projecting pieces of a hook or dovetail form are made on the outer edge of the periphery of the rim which pieces are engaged by a twisting motion with an annular groove or seat in the heated tyre, cut away parts or slots in the tyre permitting of the passage of the projecting pieces into the groove or seat. By the contracting or shrinking of the heated tyre upon the projecting pieces of the rim the tyre is fastened to the rim, the clinching or compressing of the metal of the tyre preventing the movement of the rim on the tyre. The inner edge of the tyre is fastened to the inner edge of the rim by a flange on the former taking into a groove in the latter.

A.D. 1875, February 3.—No. 394.

BECK, William Henry, of 139, Cannon Street, in the city of London.—(*A communication from Alois Steinbach & Co. of Vienna, in the Empire of Austria.*)—"Improvements in saddle girths for horses."

The invention consists in inserting in the saddle girth a series of springs for the purpose of maintaining the necessary tightness of such girth notwithstanding the contraction of the horse's belly during the exercise of riding. A locking apparatus prevents the lessening of the girth after having been tightened up by the spring, but admits of its further contraction in order to maintain the necessary tightness, and a stop prevents excessive stretching of the springs when buckling on the saddle.

A.D. 1875, February 3.—No. 395.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Andrew Bogle, of Melbourne, Victoria, merchant.*)—" Improvements in machinery for brushing boots and shoes, and for polishing, grinding and sharpening cutlery."

I first provide a framing which supports two horizontal shafts, the lower shaft has a crank and treadle and a fly wheel; the upper one has a small pulley directly over the fly wheel, a belt from which

Soap:
- Producing curative, emollient, compound & other, Green, 129.
- Using marine algæ or extracts thereof in making, Green, 129.
- Producing soap powders; compounds for making, Green, 129.
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Spindles; spindles and flyers:
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- Bearings for vertical shafts or, Collingwood, 79.
- Driving, in spinning frames, Wright & Pollard, 133.
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- Endless bands for driving, Ramsden, 221.
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- Covers for steps of, to prevent oil waste, &c., Palmer, 345.

Spinning (batting, opening, ginning and cleaning [fibres):
- Superseding batting, Clark (*Portait & Weber*), 28.
- Opening and batting cotton, &c., Haseltine (*Kitson*), 2433 [(*App.* 2.)

Spinning (carding, combing and heckling fibres):
- Screw and chain gill apparatus, Bonneville (*Martin*), 2.
- Carding & gilling worsted, silk, flax, &c., Fenton & others, 14.
- Substitute for carding, Clark (*Portait & Weber*), 28.
- Stopping carding-engine doffing cylinder, Flitcroft, 102.
- Combs with double set of teeth or pins, France, 104.
- Runners for combs to produce better slivers, France, 104.
- Condensing carding-engines, Heape, 117.
- Flattening or shaping wire for making cards, Foxwell, 282.
- Stop motion for carding-engines, Topp & others. 283.

Spinning (twisting, drawing, slubbing, roving and [doubling fibres):
- Forming rovings direct from carding-engine, Fenton & others, 14.
- Twisting machine regulator, Sauvée (*Rolin & Guitard*). 21.
- Steadying flyers and bobbin spindles, Kennedy & Acheson, 40.
- Weighting top and delivery rollers, Kennedy & Acheson, 40.
- Working copping or building rails, Kennedy & Acheson, 40.
- Doubling, twisting and winding, Lœwenstein & Ward, 78.
- Stop motion for winding machinery, Lœwenstein & Ward, 78.
- Driving spindles, Wright & Pollard, 133.
- Endless driving bands for use in, Ramsden, 221.
- Mounting and arranging driving bands, Binns, 335.
- Covers of spindle steps to prevent oil waste, Palmer, 345.
- Clothing or coating rollers, Edwards (*Edwards*), 357.

Spirometers:
- For medical purposes, &c., Mayer, 259.

Splashing when walking (preventing). *See* Boots.

Spools. *See* Bobbins.

Spoons and ladles:
- Table rest for, Cave, 571 (*App.* 34.)

Springs:
- Air or gas, Dick (*Giffard*), 55.
- For shuttles used in weaving, Pye, 70.
- Flat wire, for stop motions, &c., Lancaster, 250.
- Producing steel for making, Clark (*Eyquem*), 256.

Stables; cattle sheds:
- Disinfecting or cleansing floors of, Wheeler, 1592 (*App.* 44.)

Stairs:
- Compound for and forming steps of, Pope, 159.

Starch:
- Preparing grain, &c. for making, Johnson (*Adamson*), 381 [(*App.* 5.)

Stays and corsets:
- Using straw or tuscan plait, &c. for, Williamson, 82.
- Stud fastenings for busks, Stokes & Goff, 254.

Steam-boiler furnaces. *See* Furnaces.

Steam-boilers (cleansing; preventing incrustation [in: cleaning tubes):
- Preparation for ("apparature"), Scott (*Gerard*), 38.
- Drying and coating, with fat when out of use, Baker, 86.
- Arranging mud collector, Abel (*Smith & Smith*), 244.
- Using plumbago in, to prevent incrustation, Mason, 245.
- Purifying feed-water, Allibon & others, 264.
- Filtering rain, ditch and other water for, Lambert, 360.
- By preventing sediment in feed-water, Mosman, 751 (*App.* 36.)
- Anti-incrustation battery, Morgan-Brown (*Crompton*), 1967 [(*App.* 49.)

Steam-boilers (generating and superheating steam):
- Material for packing man-hole or joints of, Fish, 9.
- Utilising waste heated air in, Fisher & Rutherford, 56.
- Preventing priming in, Simmons, 65.
- Cylinder and piston combination for, Boulton, 96.
- Rivetting boiler plates, Nussey & Leachman, 139.
- Generating steam in gas and hot air engines, Vera, 175.
- Portable drilling apparatus for use in making, Enoch, 190.
- Condensing surplus steam in marine, Johnson & Allan, 191.
- Increasing evaporation; preventing priming, Graham, 202.
- Salt water steam generator, Perkins, 224.
- For warming railway carriages, Scott (*Haag*), 236.
- Arranging and setting in tiers, Abel (*Smith & Smith*), 244.
- Constructing and arranging marine, Allibon & others, 264.
- Preventing priming and saving fuel in, Allibon & others, 264.
- Boiler shell plate drilling machines, Allan, 297.
- Fitting or connecting tubes, Johnson (*Constant*), 301.
- Steam-generating grate, Lake (*Farris*), 310.
- Preventing priming in, Stockley, 358.
- Arranging, for utilising exhaust steam, Mosman, 751 (*App.* 36.)
- Arranging and preventing priming, Alison, 957 (*App.* 47.)
- For producing and cooling superheated steam, Dixwell, 1012 [(*App.* 38.)
- Regulating temperature of superheated steam, Dixwell, 1012 [(*App.* 38.)
- Multitubular; superheater; setting same, Hessel (*Pregardien*) [1636 (*App.* 45.)
- Internal flues & water tubes, Galloway & Holt, 2514 (*App.* 3.)
- Steam superheaters, Powleson, 2565 (*App.* 4.)

Steam-boilers (water-feeding; heating feed-water):
- Arrangement of feeding mechanism, Rowland, 94.
- Heating water and feeding same to, Johnson & Allan, 191.
- Feed pumps, Perkins, 224.
- Arranging feed-water heater, Abel (*Smith & Smith*), 244.
- Heating feed water, Allibon & others, 264.
- Heating feed-water, Lake (*Farris*), 310.
- Reconverting exhaust steam and heating same, Mosman, 751 [(*App.* 36.)

Steam-engine condensers. *See* Condensers.

Steam-engine cylinders. *See* Cylinders.

Steam-engine governors. *See* Governors.

Steam-engine pistons. *See* Pistons.

Steam-engine valves. *See* Valves.

Steam-engines (indicating speed of). *See* Indicating.

Steam-engines (locomotive, marine and stationary):
- Material for packing steam chest covers, Fish, 9.
- Reciprocating, for saving steam and power, Fielden, 17.
- Or fly-wheel revolved by steam impinging on it, Turnock, 51.
- Rotary cellular fuel saving, Boyman, 67.
- Combined hot gas and, Boulton, 96.
- Rotary and reciprocating, Higginson, 108.
- Working engines by hot air and steam, Vera, 175.
- Lubricating working parts of, Jeyes & Turner, 205.
- High pressure marine and other, Perkins, 224.
- Auxiliary engines for, to avoid waste of steam, Perkins, 224.
- Rotary; regulating expansion in same, Cory, 286.
- Self-acting variable cut-off, Mitchell, 318.
- Double cylinder portable and other, Hughes, 372 (*App.* 5.)
- Steps for locomotives, Haseltine (*Keene & Sawyer*), 700 (*App.* [35.)
- Using superheated steam expansively in, Dixwell, 1012 (*App.* [38.)
- Variable cut-off for superheated steam, Dixwell, 1012 (*App.* 38.)
- For actuating paddles, Haseltine (*Edson & Silliman*), 1677 [(*App.* 45.)
- To avoid dead points, &c., Bruce & Antisell, 2016 (*App.* 49.)
- Double-acting rotary, Patrick, 2499 (*App.* 3.)

Steels. *See* Knives.

Steering and guiding ships:
- Method of and gear for, steam ships, Absalom & Griffiths, 131.
- Indicating position of rudder to vessels, Briebach. 313.
- Lights for indicating course, Johnson (*Lamarre*), 499 (*App.* 5.)

My invention is applicable to the stop motion of drawing frames and other machines of the same nature in which slivers are delivered into cans. The machinery consists of a lever hinged to the upper side of the presser wheel in which is a hole to receive a curved edged disc fixed to the lever, the outer end of which is knife edged. To the table in which the presser wheel revolves is hinged a frame with a knife edged arm. To this frame is hinged a tumbler lever, one arm of which forms an inclined plane, and another arm is placed over a tube or guide in which the rod of an ordinary vibrator is free to move.

A.D. 1875, February 3.—No. 402.

NEIL, CHARLES, of Sheffield, in the county of York, toolmaker.—"Improvements in the construction "of stocks and dies for cutting screws."

Sides of stocks slotted through; dies fit in slot and are brought together by a bolt with a nose and a key with a nose or the former only.

A.D. 1875, February 3.—No. 403.

BISHOP, GEORGE, of the firm of Marion and Company, of Soho Square, in the county of Middlesex.—(*A communication from Johann Frederich Knip, of Offenbach, Germany.*)—"An improved stand for "exhibiting photographic pictures."

The invention consists of a stand with revolving holder carrying pivoted frames, leaves, or clips for holding the pictures disposed radially round a central pivot and capable of being separated or opened like the leaves of an album for the purpose of viewing the pictures.

A.D. 1875, February 3.—No. 404.

CLARK, WILLIAM, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Gaspard Malo, of Paris, France.*)—"Improvements in the construction of ships or vessels with the "object of saving life at sea."

The invention consists in providing vessels with a poop independent of the hull, and constructed in the form of a flat bottomed boat which may be floated off in the event of the vessel being in a sinking condition.

A.D. 1875, February 3.—No. 405.

FYFE, ALEXANDER LESLIE, and **HARRIS, CHARLES**, both of Aldersgate, in the city of London.—"Improvements in ladies' dress improvers."

The invention consists in the manufacture of dress improvers of the fabric called buckram, either alone or in combination with swansdown cloth and calico or other suitable fabric coated on the inside with indiarubber, the whole being moulded in heated dies of the form desired.

A.D. 1875, February 3.—No. 406.

WILCOX, MATTHEW, of Birmingham, in the county of Warwick, manufacturing jeweller.—"A combined seal and watch key."

My improvement consists in first forming a watch key of any approved pattern, and then taking a swivel seal of the ordinary kind, attaching the usual ornament or projection to the one side of the bow of the said seal, but not to the other side: so leaving the tube on this other side of the bow of the seal free to receive within it the pipe of the before-named key, from whence it can thus be withdrawn at pleasure, and when required for use, and being in the meantime protected from dust, dirt, and other matters with which the pipe of a watch key becomes in time choked unless protected.

A.D. 1875, February 3.—No. 407.

BARLOW, HENRY BERNOULLI, of Manchester, in the county of Lancaster, patent agent.—(*A communication from John Frank Stratton, of Gohlis, near Leipzig, in the Kingdom of Saxony, manufacturer.*)—"Improvements in apparatus for regulating and indicating the level of water in steam boilers, and for "sounding an alarum."

The apparatus consists of a cylinder which is in communication with the steam and water spaces of the boiler. In this cylinder works a float, the spindle of which rises and falls according to the level

Turnstiles:
- For tram-cars, Morgan-Brown (*Johnson & Harding*), 2250 [(*App.* 52.)

Tuyeres:
- Arranging, in purifying metals, Smith, 217.

Twine. *See* Ropes.

Type (distributing). *See* Printing.

U.

Umbrellas, parasols and sunshades:
- Runners and top notches for, Holland (*Myers*), 34.
- Tools &c. for making ribs & stretchers, Holland (*Myers*), 34.
- Paper material for sticks of, Gandy, 52.
- Shaping and cutting paragon wire for, Worrall & Worrall, 189.
- Ribs, stretchers and stops, Willis, 298.
- Combined telescopic runner and "tip-cup," Harrison, 363.
- Frames, to dispense with spring catches, &c., Charageat, 1046 [(*App.* 48.)

Upholstery:
- Life-preserving mattresses and pillows, Clark (*Peck*), 49.
- Embroidering fabrics for, Leach & Webb, 257.
- Edging scolloped borders of curtains, Gedge (*Cornely*), 306.
- Life preserving bed or cushion, Haskell, 2662 (*App.* 5.)

Upsetting metals:
- Heel end of horse-shoes, Lake (*Russell*), 48.
- Heading chisel pointed nails, Rogers (*Mullholland*), 161.
- Forming watch chain swivel heads, Clark (*Edge*), 1615 [(*App.* 45.)
- Forming eyes upon pickaxes, adzes, &c., Chapman, 1823 (*App.* [47.)

V.

Valves (air):
- Operating, of rock drilling machines, Wise (*Levet*), 3.
- For hydro-pneumatic motors, Fisher & Rutherford, 56.
- Regulating flow or pressure of air, Cave, 141.
- Reducing, for air break apparatus, &c., Steel, 333.
- Rock-drill engine, Haseltine (*Winchester & Phelps*), 485 [(*App.* 33.)

Valves (gas):
- Arranging, of gas or petroleum engines, Abel (*Daimler*), 71.
- Regulating flow or pressure of gas, Cave, 141.
- For railway carriage regulators, Clark, 198.

Valves (miscellaneous):
- For rotary cellular engines, Boyman, 67.
- Equilibrium cock or valve for high pressures, Johnson, 156.
- Portable apparatus for drilling flanges of, Enoch, 190.
- For railway carriage heating apparatus, Scott (*Haag*), 236.
- Oil, for furnaces burning oils, Clark (*Robinson*), 338.
- For reservoir penholders, Mackinnon, 2497 (*App.* 3.)

Valves (steam):
- Material for packing stuffing-boxes of valve rods, Fish, 9.
- For rotary cellular engines, Boyman, 67.
- Pressure regulators and safety, Cave, 141.
- Automatic easing apparatus for safety, Gilmour, 164.
- Piston and other, for marine and other engines, Perkins, 224.
- Combined cut-off and slide valve, Broadbent & Westerby, 231.
- For railway carriage heating apparatus, Scott (*Haag*), 236.
- For steam-generating furnaces, Lake (*Farris*), 310.
- Working cut-off slide, Mitchell, 318.
- For furnaces burning crude oils, Clark (*Robinson*), 338.
- Arranging, of double cylinder engines, Hughes, 372 (*App* . 5.)
- Balanced slide-valves, Haseltine (*Smythe*), 422 (*App.* 32.)
- Rock-drill engine, Haseltine (*Winchester & Phelps*), 485 [(*App.* 33.)
- Safety, coned on under side, for boilers, Alison, 957 (*App.* 47.)
- Variable cut-off, for superheated steam, Dixwell, 1012 (*App.* 38.)
- Steam loaded safety, for boilers, Lake (*Wilson*), 2234 (*App.* 51.)

Valves (water):
- For hydro-pneumatic motors, Fisher & Rutherford, 56.
- Safety, for thermal hydro motors, Boyman, 67.
- Arranging, for applying railway breaks, Clark, 80.
- Regulators for hydrostatic motors, Clark (*Bontemps*), 99.
- Regulating flow or pressure of water, Cave, 141.

Valves (water)—*cont.*
- For hydrants and fire-cocks, Blakeborough & Beck, 227.
- For water-heating furnaces, Lake (*Farris*), 310.
- Arranging, of hot-water apparatus, Ormson, 317.
- Differential gear for working pump, Davey, 383.
- For hydraulic presses, Clark (*Rochow & Matthiessen*), 1810 [(*App.* 46.)

Varnishes; lacquers:
- Using alkannin in lacquers for metals, Jensen (*Hamburg-[American Sewing Machine Co.*), 26.
- Solvents for use in making, Mackay, 200.

Vegetables (preserving). *See* Preserving food.

Ventilating drains and sewers:
- To prevent gases entering houses, Potts & Darnell, 272.

Ventilating houses and buildings:
- Hot-air stoves for, Howarth, 240.
- Cooling, Weatherby, 351.
- Syphon and single tube, Hill & Hey, 362.
- Ventilators appearing like dormer lights, Hill & Hey, 362.

Ventilating ships:
- Working pumps for use in, Deverell & Tower (*Deverell*), 308.

Vermin. *See* Insects.

Victoria Melton. *See* Felt.

Vinegar. *See* Acids.

W.

Walls and partitions:
- Peat-cement for coating brick, Wilkinson, 60.
- Lattice framework covering for, Rideal, 113.
- Compound material for and forming, Pope, 159.
- Transferring designs to, Vaughan (*Maynard*), 1003 (*App.* 4.)

Warp fabrics:
- For straps, bands, harness, ropes, pipes, &c., Boucley, 451 [(*App.* 3.)

Warping and beaming machines:
- Substitute for wraiths or combs; stop motion, Lancaster, 250.

Washing and scouring fabrics and fibres:
- Water circulator for "coppers," Collier & Holding, 19.
- Soap for wool washing, Green, 129.

Washing china, glass and earthenware articles:
- Plates, dishes, cups, glasses, bottles, &c., Hope-Vere, 183.

Water-closets:
- Supplying water to, Rydill, 150.
- Ventilating, Potts & Darnell, 272.

Washing fabrics:
- Clothes, Jensen (*Bohlken*), 295.

Watering and irrigating:
- Constructing irrigation areas, Rydill, 150.
- Double valved hydrants, Blakeborough & Beck, 227.
- Cocks for water-posts, Chameroy, 417 (*App.* 1.)

Watering-pots:
- Attachment for holding fertilisers, Wheeler, 1592 (*App.* 44.)

Water-meters. *See* Meters.

Water-power engines; hydraulic motive-power:
- Thermal hydro motors, Boyman, 67.
- Hydrostatic motors, Clark (*Bontemps*), 99.
- Rotary and reciprocating, Higginson, 108.
- Hydraulic engines for raising loads, &c., Casson, 123.
- Rotary; regulating expansion in same, Cory, 286.
- From the motion of ships, Deverell & Tower (*Deverell*), 308.
- From tides acting on waterwheels, Wilkinson, 380 (*App.* 5.)
- Hydraulic engines, Clark (*Rochow & Matthiessen*), 1810 [(*App.* 46.)
- Accumulators for, Clark (*Rochow & Matthiessen*), 1810 (*App.* [46.)

Water-proof fabrics; water-proofing:
- Substitutes for wood, leather, &c., Gandy, 52.
- Canvas, &c. by means of lead, Clark (*Rogé & others*), 288.
- Boots, Benson (*Williams*), 437 (*App.* 32.)

The principal feature of this invention consists in an arrangement by which, when more than one machine is driven by the same motive power, the speed of each machine, together with the power of starting and stopping it, is placed under the control of the operator thereat by means of a disk connected with the driving gear, and a smaller wheel connected with the machine, driven by the friction of the flat surface of the disk against its edge, and which can be made to approach or receed from the centre of the disk as a more rapid or slower motion is required.

A.D. 1875, February 4.—No. 414.

COTTRILL, Samuel, of Salford, in the county of Lancaster.—"Improvements in apparatus for working "railway signals."

This invention relates to the working of station and distant signals upon railways, the apparatus being so constructed and arranged that it can either be worked by hand or actuated automatically by the engine tender or other portion of a passing train.

A.D. 1875, February 4.—No. 415.

MACLAREN, Joseph, of Edinburgh, in the county of Mid Lothian, North Britain.—"An improved "watch protector."

The contrivance comprises two metal buttons, one of which is fitted with a pointed centre pin screwed to fit in a screwed centre hole in the other, and the two are fixed inside the vest pocket and have attached a ring through which the chain or guard of the watch is passed.

A.D. 1875, February 4.—No. 416.

CHAQUETTE, Ephraiem, of the city and county of San Francisco, state of California, in the United States of America.—"An improved machine for holding, turning, and shearing sheep, including also "improvements in sheep-shearing implements adapted to this and other sheep-shearing machines."

The first part of this invention consists of a novel device for holding and turning the sheep will it is being sheared, this is accomplished by placing the body of the sheep upon an endless belt or bed, and securing the feet of the sheep in rotating clamps or stocks, so that the rotation of the stocks will cause the body of the sheep to turn upon the endless belt or table. The weight and movement of the body of the sheep causes the upper surface of the belt to travel towards the front of the machine and carry the sheared fleece with it.

The second part of this invention relates to improved sheep shearing implements, and the mechanism for operating them in combination with my rotating table arrangement; said shear operating mechanism, being adjustable, automatic, and universal in its operation, the shears being moved and directed by the hand of the person attending the machine.

A.D. 1875, February 4.—No. 417.

CHAMEROY, Edme Augustin, of Rue du Faubourg St. Martin, 162, at Paris, manufacturer.—"Improvements in cocks for water, steam, air, or gases."

This invention has for object improvements in the construction of cocks in order to prevent the shock or recoil which is generally produced in water pipes at the time of closing the cocks.

The several improved arrangements of which the invention consists are all based on the principle of the slow closing of a movable valve whatever be the pressure of water in the supply pipe and notwithstanding the act of the person drawing the water.

AD. 1875, February 4.—No. 418.

WADSWORTH, John, of St. Ives, Huntingdonshire.—"Improvements in stoppers for bottles containing aërated waters."

Making stoppers of pipe clay cylindrical in shape and provided with india rubber washer.

A.D. 1875, February 4.—No. 419.

MUNN, Allan, commission agent, **RENNIE, John**, engineer, and **SUTHERLAND, John**, engineer, all of Glasgow, in the county of Lanark, North Britain.—"Improvements in the sinking of cylinders "for foundations, and in the machinery or apparatus therefor."

This invention consists in the sinking of cylinders for the foundations of bridges, harbour works, and other similar structures, by excavating the earth from within and below these cylinders by revolving screw or angled cutters at the lower end of a central shaft or shafts revolving within the cylinders, preferably with a case, pipe, or vessel surrounding or outside the cutters; all sinking with these as they excavate the earth and hole or recess below them. The shafts are driven by toothed or friction gearing carried by a portable frame on the top of the cylinder being sunk, the shafts as they descend sliding through the eyes of their driving wheels; the material when excavated and screwed up into the surrounding case being lifted therewith by special winding mechanism and chain actuated by the same engine which works the boring screw, or when a case is not used, by pumps or by steam or water jet apparatus.

A.D. 1875, February 4.—No. 420.

LOEWENBERG, Henry, chemist, of Charlottenburg, near Berlin, in the Empire of Germany.—"A "new and useful process in the manufacture of imitation braids, trimmings, leather, wood, and other "articles."

This invention relates to the production of flexible or elastic casts in imitation of leather, straw, or woven goods, wood, ornaments, &c. A mould is first made of the object to be imitated by pouring over the same a compound, consisting by preference of a solution of glue with glycerine, which is removed after it has solidified.

Into this mould is then poured a liquid compound, consisting of a solution of glue with glycerine, oil, or soap, and any desired colouring matter. Before this solidifies, the greater portion is poured out again, leaving a thin layer in the mould, which is removed after it has solidified. The surface of the mould is treated with chromic acid or acetate of iron to prevent the compound adhering to it.

A.D. 1875, February 4.—No. 421.

ADIE, Patrick, of Pall Mall, in the county of Middlesex, mathematical instrument maker.—"Improve"ments in apparatus for clipping horses and other animals."

The application of a check stud placed on the plates of the cutting apparatus for the purpose of taking off the strain caused by the oscillating motion of one plate on the other from the studs or screws which hold the two plates in contact.

A.D. 1875, February 4.—No. 422.

HASELTINE, George, of the "International Patent Office," Southampton Buildings, London, Doctor of Laws.—(*A communication from Edward Tilden Smythe, of the city and state of New York, United States of America.*)—"Improvements in balanced slide valves."

This invention relates to improvements in balanced slide valves, and consists mainly in the combination with a slide valve proper of a peculiarly constructed balance or frame, which is adapted to rise vertically when steam is introduced into the chest, and press upon the upper side of the latter for the purpose of excluding the steam from the upper side of the valve, by which means an excess of downward pressure is prevented and the valve is properly balanced in its movements.

A.D. 1875, February 4.—No. 423.

THEILER, Richard, 86, Canonbury Rd., county of Middlesex, telegraph engineer, and **HIGGINS**, Frederick, 17, Cornhill, in the city of London, engineer.—"Improvements in 'tell tale' or registering "clocks."

These clocks are so constructed that the time shown on the dial can be printed upon a ribbon of paper at any moment by simply either pulling a cord, pressing a knob, or turning a handle attached or connected with the said clock.

A.D. 1875, February 4.—No. 424.

REEVES, Thomas, of Wandsworth Road, in the county of Surrey, accountant.—"Improvements in the "construction of sewing machines."

The chief object of this invention is to ensure to the ordinary shuttle of the sewing machine an easy, rapid and silent action. To this end instead of giving to the shuttle a reciprocating motion I cause it to revolve around the axis of the carrier.

A.D. 1875, February 4.—No. 425.

CROMBIE, Edward Ellice, of the Metropolitan Works, Diana Place, Euston Road, in the county of Middlesex.—" Improvements in dry gas meters."

The object of this invention is to reduce the friction of dry gas meters to a minimum, and to do away with the intricate gas passages under the valve plate, at same time increasing the capability of working at a lower pressure than hitherto, and the obtaining a larger and steadier flow of gas through it than from any other meter in existence of an equal size.

A.D. 1875, February 4.—No. 426.

TURNER, Charles, of Southampton, in the county of Hants, civil engineer.—" Improvements in " couplings, more especially applicable for repairing broken shafts."

This invention mainly consists in arrangements for repairing broken shafts of machinery of various kinds, and also broken pipes. One form of coupling consists of two main parts, a gland and driving socket or stuffing box, said two main parts being divided in two parts, connected together by inclined teeth. When applied to a shaft the gland and driving socket are placed on the shaft in their two parts and driven up tight. Packings of india rubber are introduced, and also at each end are dished rings of soft metal with a ring of leather in the middle. Bolts (compound) are used for uniting the gland and the driving socket. The soft metal rings inside the gland prevent the packing squeezing out at the ends, and the india rubber packing is compressed and forced into **V** grooves, which are formed on the shaft and the socket. Instead of one gland two may be used, and a double end driving socket and ordinary bolts with double screwed ends are used instead of the compound ones. Another form of coupling consists in it being formed in two parts consisting of iron recessed rings, each ring being united together by dove-tailed keys. Into these iron rings tapering rings of soft metal are introduced, the recesses being turned slightly oval to prevent soft metal from turning round.

A.D. 1875, February 4.—No. 427.

SPENCE, Henry Grant, of South Stockton on Tees, in the county of York.—" Improved arrange- " ments for connecting the various pipes, cocks, and valves, to the bottoms and sides of ships or " vessels, with the view to afford greater safety to ships and vessels."

The present invention is mainly improvements on Letters Patent granted January 6th 1872, No. 56, and consists in constructing boxes or wells of iron or suitable metal (not less than two) fixed to the side of the ship in any suitable position and rendered perfectly water tight. The boxes are fitted with rod arrangements for working same from deck, and valve arrangements connected inside said boxes are operated by the arrangements from the deck. One of the boxes or wells contains the injection valve and the other the blow off cock.

A.D. 1875, February 4.—No. 428.

HALL, James, and HALL, David, both of Glossop, in the county of Derby, machinists.—" Improve- " ments in self acting temples for looms."

Our improved temples consist of two endless straps or chains, which are provided with pins for taking hold of the selvages; these straps or chains pass around three rollers or guides, one near the fell of the cloth, one in front of the breast beam, and the other near the emery or taking up roller; the pins on these straps or chains hold the selvages until the cloth is wound up.

A.D. 1875, February, 4.—No. 429.

CAMERON, Adam Scott, of the city and state of New York, United States of America, now of No. 8, Southampton Buildings, London, engineer.—" Improvements in steam engines."

This invention relates first, to improvements in expansion gear for steam engines working with slide valves. I employ cut off valves in combination with the main slide valve of a steam engine, steam being admitted to the cylinder of the engine through openings in or through the said main slide valve which openings are controlled by the said cut off valves. The second part of my invention relates to means whereby a pumping engine can be constructed to work expansively by proportioning the movement of the pump plungers or pistons relatively to the movement of the steam piston so as to compensate for the gradually diminishing pressure in the steam cylinder.

A.D. 1875, February 4.—No. 430.

PORTER, George, Junior, of Cullum Street in the city of London gas and hot-water engineer.—"Improvements in gas burners."

These improvements relate to the novel construction of argand and other gas burners and is designed to increase brilliancy of the light, to economize gas, and prevent accidents.

A.D. 1875, February 5.—No. 431.

REDFERN, Thomas, SMITH, Peter, and LAW, John Harvey, all of Bury, in the county of Lancaster, paper machinists.—" An improved jacket stretcher for paper makers."

The features of novelty in this invention consist in forming a jacket stretcher by connecting a pair of parallel stretchers at regular intervals along their length, and by means of suitable connecting links to a central bar which is capable of being screwed forwards against a cross-head, and at the same time of forcing the stretchers outwards in a parallel direction to any desired extent.

A.D. 1875, February 5.—No. 432.

BARKER, John, of the Park Street Ironworks, Oldham, in the county of Lancaster, engineer.—"Improvements in warehouse hoists or cranes."

My improved hoist or crane consists of a large pulley driven by a friction pulley, and of a barrel on which the chain or cord is wound as usual, also of a carriage supporting the guide pulley running on an inclined beam. The large pulley is held in contact with the friction pulley by a long lever which is raised and allowed to drop by means of an upright shaft. When the carriage has to be taken back after having been drawn in, another pulley is brought into contact with the friction pulley and to the axle of this other pulley is fixed a double scroll.

A.D. 1875, February 5.—No. 433.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Charles Gaudefroy, fils, of Beaucamps-le-vieux (Somme), France, merchant.*)—" A new or improved asphaltic fabric for roofing, and for other purposes."

This asphaltic fabric is composed of a web of animal hair or flock steeped in a bath of gas tar pressed between two cylinders to expel the excess of tar, then spread upon the ground and sprinkled with peat ashes, care being taken to make them enter the web, which is allowed to dry a little, is again steeped in a bath similiar to the first, then again pressed, spread out to thoroughly dry in the air, and finally, before being rolled up it is sprinkled with fine river sand.

In applying the fabric as a roofing the boards usually placed upon the rafters are dispensed with, the rafters are placed about a foot apart, and the fabric is at once nailed thereon. The edges of the fabric are brought close together and the joint is covered by laths, which are afterwards coated with tar.

Vegetable tar, asphalt, and analogous matters may be substituted in lieu of the gas tar and the peat ashes be replaced by vegetable or other ashes, earth, or an equivalent.

A.D. 1875, February 5.—No. 434.

GEDGE, William Edward, of No. 11, Wellington Street, Strand, in the county of Middlesex, patent agent.—(*A communication from Charles Gaudefroy, fils, of Beaucamps-le-vieux (Somme), France, merchant.*)—" A new or improved quilted fabric for covering steam engines and for other purposes."

The quilted fabric the subject of this invention is intended to protect the objects and apparatus to which it is applied from the effects of the surrounding atmosphere.

This fabric is composed of two superposed layers of animal hair or flock, between which is placed a thick thread or weft of the same material forming parllel lines extending from one edge of the fabric to the other in the direction of its breadth.

The whole is united and sufficiently strengthened by a double stitching, the threads of goat hair crossing each other between each of the thick threads or weft which they intersect at a right angle.

A.D. 1875, February 5.—No. 435.

RAWSTHORNE, Thomas, of Preston, in the county of Lancaster, cotton spinner, and **MONK**, William, of the same place, cotton spinner.—" Improved automatic self stripping motion for dirt or " other rollers in carding engines."

The features of novelty in this invention is its automatic action, whereby the stripping motion advances to the roller, (*after lifting up the casing imediately over such roller*) setting to work and stripping it and then retiring out of the way until such roller becomes again full of dirt and motes.

A.D. 1875, February 5.—No. 436.

PUENTE, Salustiano, of No. 15, Pelham Street, South Kensington, in the county of Middlesex, gentleman.—" Improvements in shears for shearing sheep."

Forming the cutting parts of sheep shears of a thicker section than the rest of the blades, either half round or other suitable form, so as to prevent cutting the skin of the sheep. Forming guards or parts to be attached to the blades of sheep shears, especially those of the usual form, which parts may be attached by means of screws or other suitable arrangement as to be easily adjusted and readily removed or attached, the screws or parts for holding the same on the blade being arranged so as not to present an obstruction when in use. Forming the parts of sheep shears on which the hand is placed when using the same of a greater length than is ordinarily done, so as to enable the shears to be used with less power or strength and prevent or diminish cramp or fatigue in the hand of the user,

A.D. 1875, February 5.—No. 437.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from Issac Frazer Williams, of the town and county of Bristol, in the state of Rhode Island, United States of America.*)— " Improvements in rubber or elastic boots, and lasts for making the same thereon."

My improvement consists in making seamless rubber or elastic boots, and in the structure or form of the last for making the foot and leg of the boots thereon.

A.D. 1875, February 5.—No. 438.

DUFRENÉ, Hector Auguste, of No. 10, Rue de la Fidelité, Paris, in the Republic of France, and 4, South Street, Finsbury, London, civil engineer and patent agent.—(*A communication from Jacob Laurent Dauner, a person resident No. 16, Rue Meslay, Paris, in the Republic of France.*)—" An " improved horse collar."

This invention consists in the construction of an improved horse collar which will fit more truly to the shape of the horse than those hitherto constructed, and will also serve for horses of different sizes.

A.D. 1875, February 5.—No. 439.

WIRTH, Frank, of the firm of Wirth & Co., patent-agency, of Frankfort on the Main.—(*A communication from Wilhelm Knaust, manufacturer, a person resident at Vienna, in the Empire of Austria.*)—" Improvements in valves."

This valve consists of a metal-cylinder and a bent pipe which slide in it, a knob, and valve-disc. The advantages of this valve compared with the ordinary constructions are as follows:—First. The pipe is gradually and slowly closed in an automatic manner. Second. Springs and elastic buffer discs which must be renewed from time to time are dispensed with. Third. The construction is a very simple one.

A.D. 1875, February 5.—No. 440.

FLACHFELD, Julius, of Basinghall Street, in the city of London, merchant.—(*A communication from Mayer Hollerbusch, of Fürth, in the Kingdom of Bavaria.*)—" A new or improved pencil or instru- " ment for writing, drawing, and marking."

Wax aniline clay (or argillaceous earth) and white of egg (or albumen) are mixed together. Other colouring matter may be used. The ingredients may preferably be made into a rod or bar form, smoothed and encased in cedar or other wood. The pencil effects several copies simultaneously.

A.D. 1875, February 5.—No. 441.

KOSLOFF, Stephan Alexandrovitch, of St. Petersburg, in the Empire of Russia, but at present of the city of London.—“ Improvements in the production of electric light, and in apparatus therefor.”

Placing the carbons on insulators, introducingt he metal wire into the carbon, and connecting it by hinges of metal; producing the nitrogen gas by rarifying the air in the globe by means of the lighted carbons, and letting the heated air escape; filling up the space in globe, and using an automatic mechanism for the passage of the electric current from one carbon to the other in case of breakage of one of the carbons.

A.D. 1875, February 5.—No. 442.

STUART, Charles, of Halifax, in the county of York.—“ Improvements in stop valves and taps.”

The box of a bevel wheel slides telescopically in valve spindle, the bevel wheel gearing into another bevel wheel attached to spur wheel, the latter gearing into rack or equivalent within valve box. The valve is attached to spur wheel; rotary motion being given to spindle the spur wheel runs up and down rack carrying valve with it.

A.D. 1875, February 5.—No. 443.

TATUM, Andrew Joseph, and ROBERTS, William Alexander, of Holloway, in the county of Middlesex.—“ Improved machinery or apparatus for driving or working sewing machines.”

The object of this invention is to drive or work sewing machines by improved machinery or apparatus, whereby the operator is relieved from the laborious action of working sewing machines or the inconvenience of having one hand engaged, as is the case in hand sewing-machines.

The machinery or apparatus consists of a series of toothed wheels and pinions put in motion by one or more coiled or box springs for the purpose of giving a fast revolving motion to a pulley communicating by a strap or band with a pulley fixed to the main shaft of the sewing-machine.

A.D. 1875, February 5.—No. 444.

HALLEY, George, of the firm of Georges Halley et Compagnie, of Louvroil (Nord), France.—“ Improved machinery for the manufacture of nut blanks.”

The object of this invention is to form screw nuts from a bar of red hot iron without any waste of material. This is effected by using two punches acting in opposite directions to form the central hole. These punches meet in the centre of the blank and squeeze out the metal laterally into dies to form the external faces of the nut.

A.D. 1875, February 5.—No. 445.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Théophile Charles Marie Huyttens, of Gand, in the Kingdom of Belgium.*)—“ Improvements in the manufacture of bread.”

This invention has for its object the production of bread at a cheap rate, which whilst equal in nutritive power and flavour to the higher priced best bread shall be capable of preserving its freshness for a much longer period than the same.

In order to effect these objects it is proposed to employ the following ingredients in about the undermentioned proportions, vizt.

For bread of the 1st quality.

Wheaten flour - - - - -	say about	100	parts by weight.
Potatoes peeled and passed through a sieve -	,,	75	,,
Salt - - - - - - -	,,	1·5	,,
Yeast - - - - - - -	,,	1·5	,,

Milk in the proportion of about 1 gallon to every ½ cwt. of the other ingredients.

For “ Seconds.”

Wheaten flour (not bolted) - - -	say about	100	parts by weight.
Potatoes (not peeled nor passed through a sieve)	,,	50	,,
Salt - - - - - -	,,	1·5	,,
Yeast - - - - - -	,,	1·5	,,

Water in the proportion of about 5 quarts to every ½ cwt. of the other ingredients.

The operation of making the bread from the before mentioned ingredients may be carried out in the manner usual in the manufacture of ordinary wheaten bread.

A.D. 1875, February 5.—No. 446.

STOKES, William Henry, of Birmingham, in the county of Warwick, manufacturing jeweller.—"Improvements in brakes for railway and other carriages, wagons, and trucks."

According to this invention each axle of the carriage has two discs upon it which bear respectively against the faces or tyres of the wheels. The said discs are capable of a slight sliding motion on the axle, but are incapable of a rotatory motion. On the underside of the carriage, arms or levers are jointed. These arms or levers turn in a horizontal plane, and are connected at their inner ends to a sliding rod extending under the middle of the carriage. The outer ends of the arms or levers are provided with two strong brake blocks, one on one side and the other on the other side of the axle. When the sliding rod is pushed home in either direction it gives motion to the arms or levers and causes the brake blocks on one or other side to act upon the discs and the latter to press with great force upon the inner faces of the wheels or tyres, and thereby to bring the wheels quickly to rest.

The arrangement described is applied to each pair of wheels of the carriage, and by connecting the ends of the sliding rods together in making up a train the guard can from his van simultaneously apply the brake power to all the wheels of the train.

A.D. 1875, February 5.—No. 447.

POUNSETT, Rothwell, of Milton House, Lindfield, in the county of Sussex.—"Improvements in the "manufacture of vinegar, and in apparatus to be used in the said manufacture."

This invention consists in causing the air to pass on its way to the acetifying vats through refrigerating apparatus containing purifying and filtering materials.

A.D. 1875, February 6.—No. 448.

POPE, Robert Philip, of No. 8, King's Road, Gray's Inn, in the county of Middlesex, architect and surveyor.—"Improvements in trapping apparatus for trapping water closets and other places to "prevent the passage of effluvia."

According to this invention the trapping is formed of tubular coils or a chamber to act as such supplied with water and caused to revolve.

A.D. 1875, February 6.—No. 449.

TYER, Edward, of No. 4, Old Street, Finsbury, in the county of Middlesex.—"Improvements in "galvanic batteries."

This invention relates to cells of galvanic batteries, a single cell being a jar or vessel with grooves or lugs in its interior or notches in its sides, into which is slid a perforated slab of non-conducting material to separate the two elements, and compound cells being formed in a box divided by permanent partitions into a number of cells, into each of which is slid a like perforated slab. In some cases the slab is clothed with paper or porous fabric. The chief object of the invention is simplicity of construction in a form which gives facility for cleansing all parts.

A.D. 1875, February 6.—No. 450.

SMITH, Walter, of Salford, in the county of Lancaster.—"An improved method of and apparatus "for blowing glass."

This invention relates to a method of blowing glass wherein the glass is blown by means of air compressed into a suitable vessel by means of a fan or air pump, instead of being blown by the breath from the lungs of the workman.

A.D. 1875, February 6.—No. 451.

BOUCLEY, Paul, of the firm P. Boucley and Co. of Nonancourt (Eure), France, manufacturers.—"Improvements in manufacturing straps, bands, harness, ropes, pipes, or other articles."

This invention relates to the manufacture of straps, flexible pipes, and other articles usually made of caoutchouc, gutta percha, or of tissue served with agglutinating or waterproofing material. Instead of tissue, wherein the weft threads take no part of the longitudinal strain, only warp threads are used passed through a reed so as to be laid uniformly side by side, and served with agglutinating material, which is a syrupy solution of caoutchouc, gutta percha, or boiled oil mingled with vulcanising agents and colour when required. For straps a number of such warps are laid together with a piece between having cross fibres to resist the pull of rivets and the like. For pipes a number of such warps are wound over each other helically on a mandril, crossing the successive turns. The whole is coated with caoutchouc or india rubber fabric, and vulcanised.

A.D. 1875, February 6.—No. 452.

GOUVERNEUR, Hyacinthe Gabriel, of Stebbington Street, in the county of Middlesex, manufacturer. —"Improvements in reeds for harmoniums and other similar free reed instruments."

These improvements consist in stamping the frame of that class of reed known as Gouverneur's reed, out of sheet metal so as to form it without ears, and through the top of the frame near each end a hole is formed, through which holes pass the screws for fixing the reed, a pad or washer being placed under the head of each screw so as to close the screw holes air tight and prevent the escape of compressed air.

A.D. 1875, February 6.—No. 453.

GOUVERNEUR, Hyacinthe Gabriel, of Stebbington Street, in the county of Middlesex, manufacturer. —"Improvements in reeds for harmoniums and other similar free reed instruments."

These improvements consist in forming the frames of the reeds by cutting them out of rolled brass, iron, zinc, or other suitable metal by means of suitably arranged cutting tools and a press (preferably by a cutter and a press similar to those employed at the Mint), the rectangular slit in which the tongue vibrates being cut out at the same time. The extremities of the frame of the reed are rounded off instead of being left square.

A.D. 1875, February 6.—No. 454.

THAYER, Linus O., of the city of Montreal, province of Quebec, Dominion of Canada, Doctor of Medicine.—"Improvements in breech-loading fire-arms."

1°. To provide an arm in which the hammer, cock, or other appliance for operating the needle striking the cartridge and igniting it, is contained within the wooden walls of the gun, & consequently protected against accident.

2°. In working the needle by means of a flat V-spring, inverted instead of a spiral spring, easily removed & replaced by the hand alone.

3°. In the greater simplicity of construction, the V mainspring serving the purposes of a mainspring & spiral spring.

4°. In the fact that (the exploded cartridge having been rejected & a new one inserted) the forward action of the bolt sends it home, carrying with it the extractor.

5°. In the use of a frame, having attached to it the mainspring, tumbler, trigger, trigger spring, & trigger guard.

6°. In providing an arm in which the greater part of the working pieces of the gun are removed by the unfixing of one screw.

A.D. 1875, February 6.—No. 455.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, civil engineer. —"Improvements in the means and apparatus for manufacturing alkali, which improvements are "partly applicable to other purposes."

The features of novelty are as follows:—

Firstly. The reduction of sulphate of baryta to sulphide of barium, by incorporating it in a powdered state with carbonaceous matter making the mixture into lumps and reducing it as specified in the method of reducing iron ores described in my Letters Patent of the first day of September in last year entitled, "Improvements in the manufacture of iron and steel."

Secondly. Reducing the sulphate of baryta to the state of protoxide of barium, by incorporating the powdered sulphate with carbonaceous matter and powdered iron ore or ferric oxide, and making the mixture into lumps for reduction according to the method described in the Specification of the aforesaid Patent.

Thirdly. The production of powdered reduced iron in accordance with the provisions of the said Patent, and incorporating such powdered iron with powdered sulphate of baryta and carbonaceous matter as the means, under the action of heat, of withdrawing all the sulphur from the sulphate of baryta.

Fourthly. The use of hydrate of baryta thus prepared for the precipitation of sulphuric acid from all salts containing that acid, but especially from the sulphates of sodium and potassium.

A.D. 1875, February 6.—No. 456.

URE, Archibald, of the city of Glasgow, in the county of Lanark, North Britain, ironfounder.— "New or improved modes and means for smelting ores and metals."

The nature and novelty of this invention consist, first, in distributing the air more uniformly round the furnace by tuyeres, the area of which is reduced to a size to give sufficient air to burn the carbon, and in the case of cupolas or re-melting furnaces for iron and steel, the air is passed through an annular chamber in the upper part of these furnaces to be heated before being led to the tuyeres; secondly, in making the smelting part of the furnace parallel or cylindrical from near the charging doors down to the tuyeres; and, thirdly, in charging the coke or coal into the centre of the furnace, and the ores or metal to be melted are placed round about the coke, and between it and the side of the wall of the furnace (in contradistinction to the usual mode of charging the coke and coal into the middle of the furnace) which effects great saving of coke. The coke or coal may be charged into the furnace in the positions referred to, either by hand or by conducting spouts above the ordinary charging door, angled to insure the charging of the coke into the centre, while the iron is charged through the usual door, around the charge of coke. Or a hollow rising and lowering cone might be hung to an actuating lever in the centre of the furnace, and which after charging the coke, might be lowered on to the coke and the ores or metal then thrown over the cone to insure their annular distribution round the furnace.

A.D. 1875, February 6.—No. 457.

LIND, James, of Liverpool, in the county of Lancaster.—" An improved fastening for securing the " ends of metal bands used in packing cotton bales and other bale goods."

This fastening is formed with a catch or hook at one side and a square or rectangular head at the other. The catch or hook is by preference tapered and in operation is inserted through a slot in the bale band made of shape to suit the hook or catch.

A.D. 1875, February 6.—No. 458.

SHANN, George, of Glasgow, in the county of Lanark, North Britain.—" New or improved arrange- " ments or constructions of steam traps."

The features of novelty which constitute this invention are the several arrangements or constructions of steam traps.

A.D. 1875, February 6.—No. 459.

WEBSTER, Leeming, of Dewsbury, in the county of York, milling machine maker.—" Improve- " ments in or applicable to machinery for 'milling' or 'fulling' fabrics."

This invention consists in the application or employment of earthenware or enamelled iron for the surfaces of the rollers, and the flanges, and the spouts, tongues, and lids, and the throats and knocking-off boards, forming parts of "milling" machines, and the turns, cheeks, and bottoms of stocks, and the nebs of the feet of the said stocks, instead of brass and wood as now used for those parts, whereby the cost of such machinery is reduced and the efficiency and durability is increased.

A.D. 1875, February 6.—No. 460.

VOLLMER, Henry, of the city of Manchester, in the county of Lancaster.—(*A communication from Albert Schulte, of Berlin, in the Kingdom of Prussia.*)—" An improved copying ink pencil."

The object of this invention is to produce a pencil which can be used on all kinds of paper, the writing of which shall be indeliable, and which shall give off an exact copy when a sheet of damp paper is put upon it and pressure applied, and this the inventor accomplishes by a combination of chemicals and black lead moulded or pressed into the form required.

A.D. 1875, February 6.—No. 461.

HARRISON, Samuel Lewis, of San Francisco, in the county of San Francisco and state of California, one of the United States of America, gentleman.—" Improvements in axles for railway cars and " carriages."

My said invention relates to certain improvements in that class of axles known as compensating axles in contradistinction to divided axles, and is so constructed as to allow one wheel to move faster or slower than another upon the same axle for the purpose of turning curves. These improvements consists mainly in forming two supports or journals upon the axle, one near the end and one near the middle; and upon these a sleeve turns. This sleeve has one wheel secured to it and the other wheel is secured to the main axle.

A.D. 1875, February 6.—No. 462.

WEBB, Francis William, of Crewe, in the county of Chester, engineer.—" Improvements in mechanism " or arrangements for actuating railway points and signals."

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[illegible] combinations and arrangements of [illegible] described in the Specification of a Patent granted [illegible] improved construction and combination of [illegible] unlocking, and "back-locking," and at the same [illegible] from being tampered with, or used out of their proper

[illegible] in forming a cam groove in the head of the hook bar, d, described in the [illegible] said Patent No. 442, A.D. 1874, and in arranging a lever of the first [illegible] in the centre part of the lever handle, and in connecting this lever with the [illegible] weight, so that on lifting the catch weight out of its notch in the quadrant, the [illegible] its side fitting the cam groove in the said bar, d, will lift the bar (d) and [illegible] lever handle is pulled over, the said lever will be carried forward in the cam groove, so that [illegible] catch weight being lowered into the other notch in the quadrant, one end of the lever will [illegible] but the other end will ascend, lifting the said bar, d, a second step. The ordinary [illegible] are used with this apparatus as described in the petitioner's said Specification, but for "back-locking" only a single stop is used and not two stops, as described in petitioner's said Specification. By another modification, petitioner makes the catch to enter a notch in the upper side of the quadrant, in one position of the lever handle and to enter a notch in the under face of the quadrant in the other position of the lever handle, the catch weight being forced into the latter position by a weight lever on the quadrant frame, against an arm of which the under side of the catch comes when the lever handle is pulled over.

The invention further consists in mechanism to be added to that described in petitioner's said Specification for actuating points and signals to prevent such mechanism from being wilfully tampered with or used out of its proper order, in the case of lever handles which have to be "back-locked," and consists in applying catches or shafts or sliding bars with notches, so as to lock or release by the bars d actuated by connection with the centre part of the lever handles, so that these catches or sliding bars are only actuated to lock and unlock by the "pulling over" or pushing back of the lever handles; this locking and unlocking being supplementary to that performed by the movement of the "catches" that enter the notches in the quadrants and described in the Specification of the petitioner's said Patent.

Another modification consists in the use of crank pins, excentrics, cams or cam slots in connection with the handles upon the lever handle to actuate directly both the quadrant catch and bar *d*. Such handle being in one extreme of its arc of movement when the quadrant catch is in one notch and at the other extreme when the catch is in the other notch of the quadrant.

A.D. 1875, February 6.—No. 463.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Désiré Mathurin Legat, of Paris, France.*)—" Improved sewing machinery, applicable for the " manufacture of straw hats and bonnets, and for other purposes."

This invention relates to a single thread lockstitch sewing machine producing stitches at certain intervals, suitable for the manufacture of hats, bonnets, and other articles of straw plait, and other purposes.

A.D. 1875, February 6.—No. 464.

KRITCH, William Caspar, of Leeds, in the county of York.—" Improvements in machinery or " apparatus for cutting paper."

This invention consists in arranging a framework carrying a table, upon which the paper to be cut is placed. The paper can be adjusted upon the table by means of a sliding adjusting piece worked by a screw from the end of the table, and it is then held in position by means of a press worked by a screw from above. The cutting knife is fixed to a transverse frame, which is suspended by two vibrating links, so that when it is brought down its edge passes with a curved diagonal movement through the paper. Or the knife frame may be guided by straight or curved diagonal slots. A crank upon a revolving shaft parallel with the table drives one end of a horizontal connecting rod, the other end of which is jointed to the knife frame, the bearing being made adjustable by packing pieces and set screws. The shaft is driven by a spur wheel, actuated by a pinion upon an intermediate shaft, which is itself driven by a bevilled wheel actuated by a bevilled pinion upon a driving shaft at right angles to the table. The bevilled pinion can be connected or disconnected from the driving shaft as required.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 31 to August 6, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, February 8.—No. 466.

SMITH, James, engineer to Messieurs Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain.—" Improvements in mechanical staking apparatus for boiler and other " furnaces."

In carrying out the invention there is fitted at the mouth of the furnace a hopper, at the bottom of which two short screws are fitted for the purpose of applying a positive pressure inwards to the fuel. The fire bars which are disposed longitudinally are made and placed with a general downward inclination towards the inner end of the furnace, but they have at each of two points a more or less abrupt drop and at these points apertures are formed through which two series of rods or pokers can project inwards over the lower parts. The rods or pokers are connected to a rocking shaft or are made to reciprocate.

A.D. 1875, February 9.—No. 479.

CORDILLOT, Honoré François Adolphe, of Sepouchoff, near Moscow, in the Empire of Russia, calico printer, and **MATHER, William,** of the firm of Messieurs Mather and Platt, of Salford, in the county of Lancaster, engineer.—" Improvements in apparatus for steaming printed fabrics."

Our improved apparatus consists of a brick or other chamber, the roof of which is lined with a curved steam jacket connected by side pipes to a perforated pipe near the floor. At each end of the chamber is an opening closed by a steam tight door, through which openings the waggons for the fabrics are admitted and discharged. The fabric is fed into the chamber and delivered by rollers into waggons supported upon inclined rails.

A.D. 1875, February 9.—No. 483.

DEVENPORT, Cornelius, of Birmingham, in the county of Warwick, of the firm of William Devenport, stamper and piercer and fancy jewellery manufacturer.—" Certain improvements in the construc- " tion and manufacture of crotchet hooks and handles, to be used single or duplex, and which said " improvements are also applicable for other purposes."

The object of my invention is the more securely connecting crotchet hooks with their respective handles, and protecting the same by sliding them (when out of use) within the range of the handle, and the use of the said appliances for other like purposes.

A.D. 1875, February 10.—No. 496.

DAW, Mary Weldon, wife of Samuel Daw, of 1, Parade Tredegarville, Cardiff, in the county of Glamorgan.—" Improvements in or additions to scissors."

This invention consists in forming on scissors (by preference at the point end of the blade) hooks, the edges of the said hooks being either blunt or sharp.

A.D. 1875, February 13.—No. 540,

EDWARDS, William, of 122, Rock Street, Sheffield in the county of York.—" Improvements in the " manufacture of railway and other wheels."

My invention has for its object the manufacture of solid disc railway and other wheels from ingots

The invention has reference mainly to improvements in those combinations and arrangements of mechanism for actuating railway points and signals described in the Specification of a Patent granted to the petitioner, No. 442, A.D. 1874, and consists in improved construction and combination of mechanism which will effect the required locking, unlocking, and "back-locking," and at the same time prevent the signal or point lever handles from being tampered with, or used out of their proper order.

One modification consists in forming a cam groove in the head of the hook bar, d, described in the Specification of the petitioner's said Patent No. 442, A.D. 1874, and in arranging a lever of the first order on a fulcrum pin in the centre part of the lever handle, and in connecting this lever with the rod from the catch weight, so that on lifting the catch weight out of its notch in the quadrant, the lever by a projection upon its side fitting the cam groove in the said bar, *d*, will lift the bar (d) and when the lever handle is pulled over, the said lever will be carried forward in the cam groove, so that on the catch weight being lowered into the other notch in the quadrant, one end of the lever will descend, but the other end will ascend, lifting the said bar, d, a second step. The ordinary stops are used with this apparatus as described in the petitioner's said Specification, but for "back-locking" only a single stop is used and not two stops, as described in petitioner's said Specification.

By another modification, petitioner makes the catch to enter a notch in the upper side of the quadrant, in one position of the lever handle and to enter a notch in the under face of the quadrant in the other position of the lever handle, the catch weight being forced into the latter position by a weight lever on the quadrant frame, against an arm of which the under side of the catch comes when the lever handle is pulled over.

The invention further consists in mechanism to be added to that described in petitioner's said Specification for actuating points and signals to prevent such mechanism from being wilfully tampered with or used out of its proper order, in the case of lever handles which have to be "back-locked," and consists in applying catches or shafts or sliding bars with notches, so as to lock or release by the bars d actuated by connection with the centre part of the lever handles, so that these catches or sliding bars are only actuated to lock and unlock by the "pulling over" or pushing back of the lever handles; this locking and unlocking being supplementary to that performed by the movement of the "catches" that enter the notches in the quadrants and described in the Specification of the petitioner's said Patent.

Another modification consists in the use of crank pins, excentrics, cams or cam slots in connection with the handles upon the lever handle to actuate directly both the quadrant catch and bar *d*. Such handle being in one extreme of its arc of movement when the quadrant catch is in one notch and at the other extreme when the catch is in the other notch of the quadrant.

A.D. 1875, February 6.—No. 463.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Désiré Mathurin Legat, of Paris, France.*)—"Improved sewing machinery, applicable for the "manufacture of straw hats and bonnets, and for other purposes."

This invention relates to a single thread lockstitch sewing machine producing stitches at certain intervals, suitable for the manufacture of hats, bonnets, and other articles of straw plait, and other purposes.

A.D. 1875, February 6.—No. 464.

KRITCH, William Caspar, of Leeds, in the county of York.—"Improvements in machinery or "apparatus for cutting paper."

This invention consists in arranging a framework carrying a table, upon which the paper to be cut is placed. The paper can be adjusted upon the table by means of a sliding adjusting piece worked by a screw from the end of the table, and it is then held in position by means of a press worked by a screw from above. The cutting knife is fixed to a transverse frame, which is suspended by two vibrating links, so that when it is brought down its edge passes with a curved diagonal movement through the paper. Or the knife frame may be guided by straight or curved diagonal slots. A crank upon a revolving shaft parallel with the table drives one end of a horizontal connecting rod, the other end of which is jointed to the knife frame, the bearing being made adjustable by packing pieces and set screws. The shaft is driven by a spur wheel, actuated by a pinion upon an intermediate shaft, which is itself driven by a bevilled wheel actuated by a bevilled pinion upon a driving shaft at right angles to the table. The bevilled pinion can be connected or disconnected from the driving shaft as required.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from July 31 to August 6, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, February 8.—No. 466.

SMITH, JAMES, engineer to Messieurs Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain.—" Improvements in mechanical staking apparatus for boiler and other " furnaces."

In carrying out the invention there is fitted at the mouth of the furnace a hopper, at the bottom of which two short screws are fitted for the purpose of applying a positive pressure inwards to the fuel. The fire bars which are disposed longitudinally are made and placed with a general downward inclination towards the inner end of the furnace, but they have at each of two points a more or less abrupt drop and at these points apertures are formed through which two series of rods or pokers can project inwards over the lower parts. The rods or pokers are connected to a rocking shaft or are made to reciprocate.

A.D. 1875, February 9.—No. 479.

CORDILLOT, HONORÉ FRANÇOIS ADOLPHE, of Sepouchoff, near Moscow, in the Empire of Russia, calico printer, and **MATHER**, WILLIAM, of the firm of Messieurs Mather and Platt, of Salford, in the county of Lancaster, engineer.—" Improvements in apparatus for steaming printed fabrics."

Our improved apparatus consists of a brick or other chamber, the roof of which is lined with a curved steam jacket connected by side pipes to a perforated pipe near the floor. At each end of the chamber is an opening closed by a steam tight door, through which openings the waggons for the fabrics are admitted and discharged. The fabric is fed into the chamber and delivered by rollers into waggons supported upon inclined rails.

A.D. 1875, February 9.—No. 483.

DEVENPORT, CORNELIUS, of Birmingham, in the county of Warwick, of the firm of William Devenport, stamper and piercer and fancy jewellery manufacturer.—" Certain improvements in the construc- " tion and manufacture of crotchet hooks and handles, to be used single or duplex, and which said " improvements are also applicable for other purposes."

The object of my invention is the more securely connecting crotchet hooks with their respective handles, and protecting the same by sliding them (when out of use) within the range of the handle, and the use of the said appliances for other like purposes.

A.D. 1875, February 10.—No. 496.

DAW, MARY WELDON, wife of Samuel Daw, of 1, Parade Tredegarville, Cardiff, in the county of Glamorgan.—" Improvements in or additions to scissors."

This invention consists in forming on scissors (by preference at the point end of the blade) hooks, the edges of the said hooks being either blunt or sharp.

A.D. 1875, February 13.—No. 540,

EDWARDS, WILLIAM, of 122, Rock Street, Sheffield in the county of York.—" Improvements in the " manufacture of railway and other wheels."

My invention has for its object the manufacture of solid disc railway and other wheels from ingots of cast steel, and consists in forging the said ingots into round blooms varying in size according to the diameter of the wheel required, and a hole being punched in the centre of the blooms the same are then forged or pressed in a succession of dies of different shapes until a perfect and complete wheel is produced without the aid of any rolls or rollers.

A.D. 1875, February 15.—No. 554.

MELVILL, Robert Alexander, of Essex Road, Islington, in the county of Middlesex, ironmonger.—"Improvements in apparatus for fastening windows, which apparatus is also applicable for other "fastening purposes."

An arm turning on a pivot is formed with a saddle clip or claw in which a pin works, and which travels over blocks or arcs having openings or sockets to receive the pins.

A.D. 1875, February 20.—No. 636.

ROBERTS, George, of Birmingham, in the county of Warwick, pianoforte manufacturer, and **ROBERTS, Alfred**, of Birmingham, aforesaid, pianoforte manufacturer.—"Improvements in cottage "and other upright pianofortes."

According to this invention the jack or lever is attached by a joint or centre on which it turns to the rear end of the key, so that on the removal of the key the jack or lever is brought away with it. The jacks or levers work in a horizontal rack bar over the rear ends of the keys and the escapement is effected by a regulating screw passing through the back and lower part of the jack bearing against a fixed upright on the key in conjunction with a regulating arm in front of the jack and an adjustable button on a rail in front of the rack bar. By means of the mechanism described improved musical qualities are obtained in the pianoforte as well as great mechanical advantages. The removal of a key brings with it the jack or lever, the removal of the action frame brings away the hammers, dampers, and parts connected therewith, while the rack and escapement button rail may be separately removed.

A.D. 1875, February 25.—No. 704.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from La Société Financière de Paris, of Paris, in the Republic of France.*)—"Improvements in the treatment of alunite, or of natural products containing the same, so as to obtain "aluminous compounds therefrom."

The essential points of this invention are, effecting the production of alum from alunite by the employment of a solution of sulphuric acid or of alum, or of mixtures of the same, and effecting the separation of any iron the solution may contain, by the addition of potash or of alumina, or alunite.

A.D. 1875, February 26.—No. 714.

BROWN, Joseph, of Chelsea, in the county of Middlesex, artist.—"Improvements in copper plates "for printing in inks or colours, and for ornamental purposes."

The object of this invention is to obviate the use either of the graver or of acid in the preparation of the plates, as is at present the case; the feature of novelty being the method employed for the production of incised or relief designs or impressions on surfaces from which the copper plates are afterwards obtained.

The modus operandi is as follows:—I take a sheet of thin lead or other soft material, this I place on a sufficiently resisting backing; on this lead surface the required design is drawn, which is consequently engraved or sunk on one side and in relief on the other; both the incised or raised parts being proportionate to the amount of pressure exercised by the draughtsman.

When the design is thus completed on the lead sheet, I either subject it directly to the electric battery, or I previously take an impression from it in a soft moulding substance, which I then submit to the ordinary action of the battery as before, and by this means I obtain my copper plate or printing surfaces, either incised or in relief, without, as above stated the aid either of the graver or of acid, such plates being conseuqently exact transfers of the artist's own hand work.

These plates are suitable for the ornamentation of vitreous, glazed, ceramic, metallic, wood, leather, paper, and textile surfaces.

I also sometimes employ a film of bicromatized gelatine, and exposing it to the light either through an ordinary photographic negative or tracing and then submitting it to the action of ammonia, the design is produced in relief or incised; from this the hard copper plates are obtained by the battery as before.

Or impressions may be taken of various subjects by placing them on a flat bed, on which is placed the lead sheeting backed with soft backing, and to which pressure is applied till the desired impression is obtained; this as before is submitted to the battery for producing the plates, either in relief or incised as desired.

A.D. 1875, March 6.—No. 828.

CHAMEROY, Edme Augustin, of Faubourg St. Martin, No. 162, Paris, manufacturer.—"An improved "registering, controlling, and weighing machine."

This Provisional Specification describes the construction of weighing machines, so that a printed record of the weight can be obtained by the machine itself.

A.D. 1875, March 15.—No. 956.

JONES, Ephraim Allcock, and **JONES, John Allcock**, both of Middlesbrough, in the county of York.—"Improvements in rotary puddling furnaces, and in apparatus or means employed in connec- "tion therewith."

Our invention relates to improvements in rotary puddling furnaces, and to apparatus or means to be employed in connection therewith for supplying water for circulation around the furnace, and consists:—

Firstly, in admitting water intermittently to the space between the casings of the furnace (when the furnace is composed of two casings) which are practically water tight, by various modes or contrivances.

Secondly, in effecting the egress of the water and air from the water space of the rotary furnace by means of pipes, channels, or ducts, one or more of which are coiled round the outside of the outer casing, and communicate at one end with the water space. Or, if preferred, they may be coiled in the water space, one end passing through the outing casing.

Thirdly, in connecting the water pipes which are cast in the bodies of the rings or fitted in after the rings are cast (which rings are attached to the ends of the rotary furnace) at their external ends outside the furnace, with the water space between the casings by means of branch pipes or connecting pieces.

A.D. 1875, August 3.—No. 2727.

PICTET, Raoul Pierre, residing at Geneva, in Switzerland, civil engineer.—"Improvements in "producing cold, and in the manufacture of sulphurous acid, and in apparatus for these purposes."

The claims of this Complete Specification are—

First. The mode of manufacturing liquid sulphurous acid substantially as described and shown on Sheet I.

Second. The employment of liquid sulphurous acid in freezing machines substantially as described.

Third. The arrangement of freezing apparatus substantially as described and shown on Sheets II. and III.

A.D. 1875, August 4.—No. 2740.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from David Rousseau, of the city, county, and state of New York, United States of America.*)—"Improved "electric railway signalling apparatus."

The invention relates to improved electric apparatus for operating railway signals from two or more different points by means of a single electro magnet, so that when the circuit is established through said electro magnet by an approaching train or otherwise, its armature will be attracted and cause the signal to be displayed, while when the circuit is again established by the same train after it has passed the signal and reached the second instrument or otherwise, the electro magnet will once more attract its armature and cause the signal to be moved out of sight. The invention is equally applicable to audible and visible signals.

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——— C. D. (*Smith & Smith*), 244, Jan. 22, Steam-boilers.
——— C. D. (*Meunier*), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
——— C. D. (*Mathian & Solet*), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
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Adie, P., 421, Feb. 4, Clipping horses, &c.
Alexander, E. P. (*Benwell & Humphreys*), 196, Jan. 19, Bale bands.
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——— W., & Johnson, S., 191, Jan. 18, Heating feed- [water; condensing steam.
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Alston, W., 171, Jan. 16, Adjustable chairs, &c.
American Sewing-Machine Co., Hamburg- (Jensen), 26, [Jan. 22, Printing metals.
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Aubertin, E., Boblique, L., Leplay, H., & Box, J., 181, [Jan. 16, Phosphates and phosphorus.
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Baker, J. M. B., 86, Jan. 9, Drying steam-boilers.
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——— W., 327, Jan. 28, Purifying iron.
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Bannister, R. D., & Milligan, S. (Lake), 2245, June 18 [(*App.* 51.) Device for advertising.
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Benwell, R., & Humphreys, G. (Alexander), 196, Jan. 19, [Bale bands.
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Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.) [Burning bricks, &c.
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——— L., Leplay, H., Box, J., & Aubertin, E., 214, [Jan. 20, Disinfecting sewage, &c.

A.D. 1875, August 5.—No. 2774.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from George W. Harrison, of Lausing, Michigan, United States of America.*)—" Improvements in pitman or connecting rod bearings for harvesting and other machines."

The object of this invention is to provide an elastic backing to the boxes or bearings of a pitman so that the parts may be relieved from the strain of sudden shocks.

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——— *A.* (Jensen), 307, Jan. 27, Earth-boring augers.
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Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
——— H.A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
——— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro-[magnetic telegraphs.
——— H. A. (*Richards*), 2649, July 26 (*App.* 5.) [Type-setting machines.
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Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.) [Sewing machines.
Borchart, H. (Newton), 385, Feb. 2, Bullet patching [machinery.
Boucley, P., 451, Feb. 6, Straps, bands, &c.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27, Railway signalling.
——— M. P. W., 96, Jan. 11, Hot gas & steam engines.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
——— G. T. (*Société Anonyme du Cuivre Français*), [2042, June 3 (*App.* 49.) Protosulphuret of [iron and sulphuretted hydrogen gas.
——— G.T. (*Société Anonyme du Cuivre Français*), [2084, June 5 (*App.* 50.) Kilns or ovens.
——— G. T. (*Kohrig & Pzillas*), 2486, July 10 [(*App.* 3.) Sugar.
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Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9 [(*App.* 33.) Filling and corking bottles.
Bradley, G., & Madderson, T., 63, Jan. 7, Crushing [stones, &c.
——— J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining [powder.
Briebach, J. A., 313, Jan. 27, Indicating position of [rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
——— J., F. W. & W. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
——— W. W., J. & F. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal [apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P., [76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking [apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing [electro-type shells.
Brown, J., 714, Feb. 26 (*App.* 6.) Copper plates for [printing, &c.
——— J. F., & Baird, J., 258, Jan. 23, Weaving.
——— M. H., 352, Jan. 30, Fire guards.
——— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and [windows.
——— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
——— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
——— W. Morgan- (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of type.
——— W. Morgan- (*Johnson & Harding*), 2250, June 19 [(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12, [Converting iron scraps, &c. into steel.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29, [Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.) [Vapor and gas-engines.
Buckley, J. B., & Stock, E., 378, Feb. 2, Stench traps.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway carriages; tyres.
Bustin, R. (Lake), 185, Jan. 18, Hanging wall papers.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18, Casks.
——— T., & Thornley, G., 1518, Apr. 26 (*App.* 44.) [Jointing cask staves.

C.

Cadogan, Hon. G., 328, Jan. 28, Apparatus for igniting [and holding matches.
Calley, S., & Share, H. H., 377, Feb. 2, Raising, &c. boats.
Cameron, A. S., 429, Feb. 4, Steam-engines.
Cannon, W. G., 294, Jan. 26, Cup and ball joint for gas [pendants, &c.
Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casson, T., 123, Jan. 13, Hydraulic engines.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
Cave, J. O'C., 140, Jan. 14, Aërial navigation.
—— J. O'C., 141, Jan. 14, Governor, steam gauge, [safety valve, &c.
—— J. O'C., 571, Feb. 17 (*App.* 34.) Rest for knives, [forks and spoons.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chameroy, E. A., 417, Feb. 4, Cocks for water, steam, &c.
——— E.A., 828, Mar. 6 (*App.* 6.) Weighing machines.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H. (Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing [machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket [eyes on tools.
Chaquette, E., 416, Feb. 4, Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas, parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from [fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Chivers, A. & S., 349, Jan. 29, Concentrating sulphuric [acid.

Chivers, S. & A., 349, Jan. 29; Concentrating sulphuric
[acid.
Clark, A. M. (*Portait & Weber*), 28, Jan. 2, Preparing
[fibres for spinning.
—— A. M. (*Peck*),49,Jan.5,Life-mattresses,pillows,&c.
—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of
[light and heat.
—— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
—— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting
[hats, &c.
—— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial
[apparatus.
—— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for
[nut blanks.
—— A. M. (*Eyquem*), 256, Jan. 22, Steel.
—— A. M. (*Rogé, Poret, Baffoy, & Dupré*), 288,
[Jan. 25, Preserving woven fabrics.
—— A. M. (*Robinson*), 338, Jan. 28, Feeding and
[burning oils in furnaces.
—— A. M. (*Hartwich & Geyer*), 812, Mar. 4 (*App.* 36.)
[Pumps.
—— A. M. (*Taft*),1153, Mar.30 (*App.*40.)Table cutlery
[and handles.
—— A. M. (*Edge*),1615,May 1 (*App.*45.)Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking
[screw nuts.
—— A.M. (*Rochow & Matthiessen*), 1810, May 14 (*App.*
[46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway
[for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
—— A.M.(*Lodge*),2520, July 13 (*App.* 3.), Fulling mills.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— W., 80, Jan. 9, Railway breaks.
—— W- (*Malo*), 404, Feb. 3, Ships or vessels.
—— W. (*Legat*), 463, Feb. 6, Sewing straw hats, &c.
—— W. (*Rousseau*), 2657, July 27 (*App.* 5.) Railway
[signalling.
—— W. (*Rousseau*), 2740, Aug. 4 (*App.* 6.) Railway
[Signalling.
Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8,
[Bricks, tiles, &c.
Clements, J. M., 367, Feb. 1, Sewing-machines.
Cleveland Paper Box Machine Co. (Haseltine), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
Clough, W. R. (Haseltine), 1640, May 3 (*App.*45.) Cork-
[screws.
Coales, S. L., 334, Jan. 28, Coiling and uncoiling hose
[pipes.
Coddington,R.(*Gally*),1128,Mar.27(*App.*40.)Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and
[windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Connell, A., 302, Jan. 26, Wagons.
Coombe, J. C., 287, Jan. 25, Blacking.
Constant, J. (Johnson), 301, Jan. 26, Connecting tubes
[to tube plates.
Cordillot, H. F. A., & Mather, W., 479, Feb. 9 (*App.* 6.)
[Steaming printed fabrics.
Cornely, E. (Gedge), 306, Jan. 27, Edging machines.
Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cottrill, S., 414, Feb. 4, Railway signals.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, W., & Howard, J., 277, Jan. 25, Saddle girth
[tightener.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
—— A. H., 374, Feb. 1, Marking and cutting textile
[materials.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-
[menageries.
Crocker, S.L.,778, Mar. 3 (*App.* 36.)Smelting copper ores.
Cromby, E. E., 425, Feb. 4, Dry gas meters.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
—— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
—— (Bousfield),2084, June 5 (*App.*50.)Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J.T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti-
[lating water-closets, &c.
Dauner, J. L. (Dufrené), 438, Feb. 5, Horse collars.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Daw, M. W., 496, Feb. 10 (*App.* 6.) Scissors.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
Deacon, H., 332, Jan. 28, Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving
[life at sea.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c.
[machines.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.)
[Sewing machines.
Devenport, C., 483, Feb. 9 (*App.* 6.) Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308,
[Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308,
[Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and
[stuffing box.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Dominy, G., & Russell, J., 398, Feb. 3, Guards for
[carving forks.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
—— H. A. (*Dauner*), 438, Feb. 5, Horse collars.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8,
[Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edison, T. A., 384, Feb. 2, Telegraphs.

Edson, N. T., & Silliman, C. H. (Haseltine), 1677,
[May 5 (*App.* 45.) Paddle wheels.
Edwards, Edmund (*Boullenot*), 75, Jan. 8, Safety lamps.
——— Edmund (*Edwards*), 357, Jan. 30, Rollers for
[fabrics.
Edwards, Ernest (Edwards), 357, Jan. 30, Rollers for
[fabrics.
Edwards, W., 540, Feb. 13 (*App.* 6.) Railway and other
[wheels.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Elce, J., 366, Feb. 4, Spinning and doubling.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Espir, C. (*Le Bricquir*), 291, Jan. 26, Mining powder.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Evans, P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farris, W. H. (Lake), 310, Jan. 27, Water circulating bars.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
——— W. & J., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9
[(*App.* 33.) Filling and corking bottles.
Fewster, W., 293, Jan. 26, Saving life and property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Financière de Paris (la Société) (Johnson), 704, Feb. 25
[(*App.* 6.) Treating alunite.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air
[engines, &c.
Fitz, E. E., 187, Jan. 18, Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flachfeld, J. (*Hollerbusch*) 440, Feb. 5, Pencils.
Flagler, H. K. (Hunt), 290, Jan. 26, Welding tubes, &c.
Flitcroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing-
[machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
Fouillon, J. (Maes), 331, Jan. 28, Gloves.
Foundries & Forges Co. (Browne), 120, Jan. 12, Con-
[verting iron scraps, &c. into steel.
Fox, G., & J. H., 309, Jan. 27, Finishing woollen fabrics.
—— J. H. & G., 309, Jan. 27, Finishing woollen fabrics.
Foxwell, D., 282, Jan. 25, Shaping wire.
France, W. H., 104, Jan. 12, Combing wool, &c.
Francis, G. W., & Brownlow, D. R. (Lake), 340, Jan. 29,
[Coating for metals.
Friedlander, J., & *Jachimovicq, C.*, 266, Jan. 23, Collect-
[ing crops.
Furrell, E. W. (*Browne*), 241, Jan. 21, Stand for charts, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, A. L., & Harris, C., 405, Feb. 3, Dress improvers.
—— D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele-
[graphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for
[wood, &c.
——— M., 173, Jan. 16, Railway wheels.
Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots
[and shoes.
——— S., & Rees, E., 320, Jan. 28, Fire bars.
Garland, H. P., 229, Jan. 21, Sewing-machines.
——— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish-
[ing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gaudefroy, C., 433, Feb. 5, Asphaltic fabric.
——— C., 434, Feb. 5, Quilted fabric.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
—— W. E. (*Cornely*), 306, Jan. 27, Edging machines.
—— W. E. (*Gaudefroy*), 433, Feb. 5, Asphaltic fabric.
—— W. E. (*Gaudefroy*), 434, Feb. 5, Quilted fabric.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Geiger, T., & Niemann, G. (Hildebrandt), 316, Jan. 27,
[Tramways.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.
Gill, D., 268, Jan. 23, Deodorising sewer gases.
—— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer
[gases.
Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling,
[&c. beer.
Gilmore, J., 386, Feb. 2, Turning over leaves of music.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
——— W. & G., 179, Jan. 16, Railway signalling.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.
Gouverneur, H. G., 452, Feb. 6, Reeds for harmoniums, &c.
——— H. G., 453, Feb. 6, Reeds for harmoniums, &c.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
—— W., 129, Jan. 13, Soaps.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Haddan, J. C., & Smith, H., 412, Feb. 4, Carving forks.
Haggas, W., 285, Jan. 25, Looms.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hall, D. & J., 428, Feb. 4, Temples for looms.
—— J., 346, Jan. 29, Lime and cement kilns.
—— J. & D., 428, Feb. 4, Temples for looms.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.

Halley, G., 444, Feb. 5, Nut blanks.
Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.
Handyside, H., 376, Feb. 2, Chains or cables.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.
——— J., 147, Jan. 14, Sulphates.
Harper, R. R., 336, Jan. 28, Electric telegraph apparatus.
Harris, C., & Fyfe, A. L., 405, Feb. 3, Dress improvers.
Harrison, C., 363, Jan. 30, Umbrella runners.
——— G. W. (*Lake*), 2774, Aug. 5 (*App.* 6.) Harvesters.
——— S. L., 461, Feb. 6, Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9 (*App.* 33.)
[Filling and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9 (*App.*
[33.) Rock drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning
[bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.)
[Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening
[cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving
[bed.
Hayward, G., Knap, C., & Taunton R. H., 208, Jan. 19,
[Wrought iron tubes.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10 (*App.* 33.) Horse-shoe & other nails.
*Heaton, D*r. (Bousfield), 18, Jan. 1, Button fasteners.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Higgins, F., & Theiler, R., 423, Feb. 4, "Tell tale"
[clocks.
Higginson, A., 108, Jan. 12, Motive-power engines and
[pumps.
Hildebrandt, A. (*Niemann & Geiger*), 316, Jan. 27, Tram-
[ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13,
[Cartridges.
Hodson, C, 371, Feb. 1, Floor, sash, and bench cramp.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Holland, R., 393, Feb. 3, Fastening wheel tyres.
——— W., & *Myers, H.*, 34, Jan. 4, Umbrellas and
[parasols.
Hollerbusch, M. (Flachfeld), 440, Feb. 5, Pencils.
Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing
[machinery.
Holmes, R. R., 122, Jan. 13, Aërated liquors.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other
[articles.
Hough, J. E., Rimington, J. McN., Shepherd, E., &
[Rothwell, F. & T., 350, Jan. 29, Sewing-
[machines.
Howard, J., & Cox, W., 277, Jan. 25, Saddle girth
[tighteners.
Howarth, A. & W., 322, Jan. 28, Dental lathes, &c.
——— J., 240, Jan. 21, Hot-air stoves.
——— W. & A., 322, Jan. 28, Dental lathes, &c.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop-
[pering bottles, &c.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
——— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
——— H., 372, Feb. 1, Steam-engines.
——— S., & Turner, J., 392, Feb. 3, Lamp burners.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19,
[Bale bands.
Humphries, G. G., & Hutchinson, T., 397, Feb. 3, Em-
[broidering fabrics.
Hunt, B. (*Flagler*), 290, Jan. 26, Welding tubes, &c.
—— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
Hutchence, H., & Rider, F. W., 383, Feb. 2, Harmo-
[niums, organs, &c.
Hutchinson, T., & Humphries, G. G., 397, Feb. 3, Em-
[broidering fabrics.
Huyttens, T. C. M. (Johnson), 445, Feb. 5, Bread.

I.

Imlay, C. G. (Lake), 253, Jan. 22, Preventing fraud by
[tram-car conductors, &c.
Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.
Ingram, J. G., 235, Jan. 21, Washers and packing pieces.
Isherwood, S., & Weare, R., 326, Jan. 28, Carbonaceous
[material for filtering, &c.

J.

Jachimovicz, C., & Friedlander, J., 266, Jan. 23, Collect-
[ing crops.
James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
James, J., 284, Jan. 25, Railway carriages and wagons.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*)
[26, Jan. 2, Printing metals.
——— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
——— P. (*Bohlken*), 295, Jan. 26, Washing machine.
——— P. (*Bohlken*), 307, Jan. 27, Earth-boring augers.
Jeyes, J., & Turner, C. H., 205, Jan. 19, Lubricator.
Johnson, G. (Clark), 199, Jan. 19, Rolling bars for nut
[blanks.
Johnson, J. C., 209, Jan. 20, Forming tube skelps.
——— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening
[drills.
——— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer-
[ing, &c.
——— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing
[fires.
——— J. H. (*Constant*), 301, Jan. 26, Connecting
[tubes to tube plates.

Johnson, J. H. (*Adamson*), 381, Feb. 2, Starch, &c.
——— J. H. (*Marot*), 408, Feb. 3, Saccharine solu-
[tions.
——— J. H. (*Lamarre*), 409, Feb. 3, Signalling and
[illuminating.
——— J. H. (*Huyttens*), 445, Feb. 5, Bread.
——— J. H. (*Société Financière de Paris*), 704, Feb. 25,
[(*App.* 6.) Treating alunite.
——— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
——— *J. R., & Harding, G. P.* (Morgan-Brown)
[2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, R., 400, Feb. 3, Obtaining motive-power.
——— S., & Allan, W., 191, Jan. 18, Heating feed
[water; condensing steam.
——— S. H., 156, Jan. 14, Cocks or valves.
Joliot, J. P. S., 204, Jan. 19, Railway breaks.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
—— E. A. & J. A., 956 Mar. 15 (*App.* 6.) Rotary
[puddling furnaces.
—— H., & Davies, J., 248, Jan. 22, Stoppering bottles.
—— H. L., 492, Feb. 10 (*App.* 3.) Disinfectants and
[deodorizers.
—— J. A. & E. A., 956 Mar. 15, (*App.* 6.) Rotary
[puddling furnaces.
—— R. A., & Perry, J. J., 12, Jan. 1, Lighting cigars, &c.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.
Kellogg, H. (Crosby), 324, Jan. 28, Fur coated fabrics.
——— *H.* (Crosby), 325, Jan. 28, Head coverings.
Kendrick, T., 31 Jan. 4, Coffin furniture.
Kennedy, J., & Wigg, C., 314, Jan. 27, Furnaces.
——— W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23, Boots.
Kidd, J., & *Arnold, L.*, 66, Jan. 7, Gas.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening
[cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19,
[Wrought iron tubes.
Knaust, W. (Wirth), 439. Feb. 5, Valves.
Knip, J. F. (Bishop), 403, Feb. 3, Exhibiting pictures.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.
Kosloff, S. A., 441, Feb. 5, Electric light.
Kritch, W. C., 464, Feb. 6, Cutting paper.
Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 19,
[Treating and dyeing vegetable textiles.
Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 19.
[Treating and dyeing vegetable textiles.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
—— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
—— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
—— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
Lake, W. R. (*Whittemore*), 163, Jan. 15, Spikes.
—— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.
—— W. R. (*McClintock*), 207, Jan. 19, Preserving
[substances.
—— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by
[tram-car conductors.
—— W. R. (*Farris*), 310, Jan. 27, Water circulating
[bars.
—— W. R. (*Brownlow & Francis*), 340, Jan. 29, Coat-
[ing for metals.
—— W. R. (*Bogle*), 395, Brushing boots and shoes;
[polishing, &c.
—— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-
[menageries.
—— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting
[ores; making iron; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.)
[Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather
[pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing
[electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18,
[(*App.* 51.) Device for advertising.
—— W. R. (*Harrison*), 2774, Aug. 5 (*App.* 6.) Har-
[vesters.
Lamarre, E. A. A. (Johnson), 409, Feb. 3, Signalling
[and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing ma-
[chines, &c.
Law, J. H., Redfern, T., & Smith, P., 431, Feb. 5, Paper
[making.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14,
[Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining
[powder.
Lee J., 131, Jan. 13, Fire-arms.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Legat, D. M. (Clark), 463, Feb. 6, Sewing straw hats, &c.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181,
[Jan. 16, Phosphates and phosphorus.
——— H., Box, J., Aubertin, E., & Boblique, L., 214,
[Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway
[sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, G. H., 137, Jan. 13, Cigars.
——— R. T., 237, Jan. 21, Looking glasses and mirrors.
Liancourt, C. A. Count de G. de, 390, Feb. 3, Preserving
[life at sea.
Lind, J., 457, Feb. 6, Securing ends of bale bands.
Lloyd, J., & Scully, J., 226, Jan. 20, Drying wall
[papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Loewenberg, H., 420, Feb. 4, Imitation braids, leather, &c.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c.,
[threads; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.

Luckenbach, F. A., 243, Jan. 21, Casting and annealing [slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and [axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.) [Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.
—— W. A., 455, Feb. 6, Making alkali, &c.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving [substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Com- [positions for paving, &c.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c. [waste products.
Mackay, M., 200, Jan. 19, Compounds for dissolving [resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing [instruments.
Maclaren, J., 415, Feb. 4, Watch protector.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M., [76, Jan. 8, Railway wheels and axles.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing [stones, &c.
Maes, L. (*Fouillon*), 331, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 19, [Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscrip- [tions, &c.
Malo, G. (Clark), 404, Feb. 3, Ships or vessels.
Manbré, A., Beldam, W. A., & Allibon, G., 264, Jan. 23, [Steam-boilers.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard [railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.
Marchant, R. M., 304, Jan. 27, Furnaces.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marot, L. (Johnson), 408, Feb. 3, Saccharine solutions.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, J., 162, Jan. 15, Thrashing machines.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour- [dressing machines.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
—— W., & Cordillot, H. F. A., 479, Feb. 9 (*App.* 6.) [Steaming printed fabrics.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted [fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.* [44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14 [(*App.* 46.) Hydraulic engines, &c.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.) [Applying oil painting to walls.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
Meloon, H. H. & D. C., Toppan, D. L., & Chapin, G. B. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood- [planing machines.
Melvill, R. A., 554, Feb. 15 (*App.* 6.) Fastening win- [dows, &c.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8 [(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
—— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Mitchell, J. & W., 410, Feb. 3, Umbrellas and parasols.
—— W. & J., 410, Feb. 3, Umbrellas and parasols.
—— W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20 [(*App.* 35.) Filtering water.
Monk, W., & Rawsthorne, T., 435, Feb. 5, Carding en- [gine rollers.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20 [(*App.* 35.) Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
—— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and [windows.
—— W. (*Crompton*), 146, Jan. 14, Looms.
—— W. (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
—— W. (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of [type.
—— W. (*Johnson & Harding*), 2250, June 19 [(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood- [way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying [gas for aërial purposes.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and [utilizing steam
Mountford, E. C. & W., 292, Jan. 26, Games.
—— W. & E. C., 292, Jan. 26, Games.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit- [ting hats, &c.
Munn, A., Rennie, J., & Sutherland, J., 419, Feb. 4, [Sinking cylinders for foundations.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.) [Sewing-machines.
Murray, A. W., 382, Feb. 2, Lamps.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and [parasols.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Neil, C., 402, Feb. 3, Stocks and dies.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Newbold. E., 267, Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding, [&c. fibres.
Newton, A. V. (*Borchart*) 385, Feb. 2, Bullet patching [machinery.
—— H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding [engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27, [Tramways.

Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Nussey, G. H., & Leachman, W. B., 139, Jan. 14, Punching and rivetting machines, &c.

O.

Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13, Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Outerson, A. & J., 558, Feb. 16 (*App.* 34.) Filters.
——— J. & A., 558, Feb. 16 (*App.* 34.) Filters.

P.

Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine), 1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and engines.
Payton, W., & Holmes, J. E., 343, Jan. 29, Sawing machinery.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces, purses, &c.
Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485 Feb. 9 (*App.* 33.) Rock drills.
Pictet, R. P., 2727, Aug. 3 (*App.* 6.) Sulphurous acid; producing cold.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drinking bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
——— R. P., 448, Feb. 6, Trapping waterclosets, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N. (Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2, Preparing fibres for spinning.
Porter, G., 430, Feb. 4, Gas-burners.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Ventilating water closets, &c.
Pounsett, R., 447, Feb. 5, Vinegar.
Powleson, W. L., 2565, July 17, (*App.* 4.) Steam superheaters.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Puente, S., 436, Feb. 5, Sheep shear.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10 (*App.* 3.) Sugar.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21, Creased or plaited fabrics.
Rawsthorne, T., & Monk, W., 435, Feb. 5, Carding engine rollers.
Read, W., 379, Feb. 2, Buttons; attaching same.
Reckendorfer, J. (Marler), 215, Jan. 20, Pencil cases.
Redfern, T., Smith, P., & Law, J. H., 431, Feb. 5, Paper making.
Redheffer, W. (Benson), 388, Feb. 3, Freezing, churning, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knitting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reeves, T., 424, Feb. 4, Sewing-machines.
Reid, W., 166, Jan. 15, Sewing machines.
Rennie, J., Sutherland, J., & Munn, A., 419, Feb. 4, Sinking cylinders for foundations.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201, Jan. 19, Railway signals and points.
——— G. H., 2287, June 23 (*App.* 52) Rock-drilling machines.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App.* 5.) Type-setting machines.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for floors, &c.
Rider, F. W., & Hutchence, H., 383, Feb. 2, Harmoniums, organs, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., & Hough, J. E., 350, Jan. 29, Sewing machines.
Roberts, A. & G., 636, Feb. 20 (*App.* 6.) Pianofortes.
——— G. & A., 636, Feb. 20 (*App.* 6.) Pianofortes.
——— W. A., & Tantum, A. J., 443, Feb. 5, Working sewing-machines.
Robinson, C. E. (Clark), 338, Jan. 28, Feeding and burning oils in furnaces.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14 (*App.* 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E. (Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing machines, &c.
——— H. (*Mullholland*), 161, Jan. 15, Cut nails.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2, Self-acting regulator for twisting machines.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., & Shepherd, E., 350, Jan. 29, Sewing machines.
——— T. & F., Hough, J. E., Rimington, J. McN., & Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway signalling.
——— *D.* (Clark), 2740, Aug. 4 (*App.* 6.) Railway signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
Russell, H., 109, Jan. 12, Registering garments, &c. sent to laundries.
——— J., & Dominy, G., 398, Feb. 3, Guards for carving forks.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air engines, &c.
Rydill, G., 150, Jan. 14, Purifying sewage, &c.
——— G., 399, Feb. 3, Purifying sewage, &c.

S.

Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
[cussion caps.
Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.
Savage, W. P., 271, Jan. 23, Preventing accidents on
[railways.
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—— J. H., 634, Feb. 20 (*App.* 5.) Sewing machines.
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Braces or suspenders:
- Buckle or clasp for, Weldon, 77.
- Fastening for, Pendleton, 337.

Bread and biscuits:
- Ingredients for making, Johnson (*Huyttens*), 445.
- Aerotherm portable oven, Bonneville (*Lesobre*), 1937 (*App.* 48.)

Breaks for machinery:
- For hydraulic lifts when lowering, Casson, 123.
- For warehouse hoists or cranes, Barker, 432.
- Wheel & wedge device for arresting motion, &c., Wright, 754 (*App.* 36.)

Breaks for railways, tram-cars and road-carriages:
- Continuous, with shoes for pressing on rails, Foster, 10.
- Arranging and operating continuous railway, Clark, 80.
- Automatic, for perambulators, Staniland, 134.
- Continuous, with shoes, &c. pressing, Joliot, 204.
- Working continuous railway, Savage, 271.
- Working automatic railway, Burdess, 329.
- Actuating pneumatic railway, Steel, 333.
- Coupling and working continuous railway, Temple, 391.
- Constructing, arranging and working, Stokes, 446.
- Wheel and wedge device, Wright, 754 (*App.* 36.)
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Breakwaters; sea-walls:
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Brewing:
- Maturing, &c. malt liquors by sunlight, Shand, 213.
- Treating and maturing beer, Gillman & Spencer, 234.
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- Preparing grain, &c. for, Johnson (*Adamson*), 381.

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- Moulding and expelling air from, Whittaker & others, 73.
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- Pressing and moulding, Durand & Marais, 1534 (*App.* 44.)
- Kiln for burning or baking & working same, Bull, 1977 (*App.* 49.)

Bridges:
- Corrugated wrought iron plates, Westwood & Baillie, 341.
- Sinking cylinders for pier foundations, Munn & others, 419.

Brushes:
- For cleansing carriages, walls, &c, Cheatle, 230.
- Compound for making handles of, Thayer (*Smith*), 2513 (*App.* 3.)

Buckets and pails:
- Paper material for making, Gandy, 52.
- Making wooden pail handles, Haseltine (*Lyman*), 1781 (*App.* 46.)

Buckles and clasps:
- Suspension, and adjustable tab, Weldon, 77.
- Spring clip for girdles, scarfs, &c., Nelson, 145.

Buildings:
- Peat compound for, Wilkinson, 60.
- Compound for and forming parts of, Pope, 159.
- Making fireproof deposit vaults of slag, Luckenbach, 243.
- Corrugated wrought iron plates for, Westwood & Baillie, 341.
- Surfaces for steps, &c., Haseltine (*Keene & Sawyer*), 700 (*App.* 35.)
- Floodway for warehouses, Clark (*Morrell*), 2024 (*App.* 49.)

Buildings (heating and warming). *See* Heating.

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Buoys:
- Adapting lights & signals to, Johnson (*Lamarre*), 409.

Burners (gas and liquid). *See* Gas-burners.

Bustles. *See* Dresses.

Button holes:
- Sewing-machine for making, Vosper & Rogers, 251.

Buttons:
- Instrument for setting fasteners, Bousfield (*Heaton*), 18.
- Metallic fasteners for attaching, Bousfield (*Heaton*), 18.
- Fastening for, and tool for fixing same, Feldman, 88.
- Stud fastening, Stokes & Goff, 254.
- Attaching, to wearing-apparel, Read, 379.
- Compound for making, Thayer (*Smith*), 2513 (*App.* 3.)

C.

Cables or ropes. *See* Ropes.

Camp and field equipage:
- Portable camp cooking stove, Tomkins, 114.
- Portable cooking stove and utensils, Dann (*Gervais*), 1741 (*App.* 46.)
- Aerotherm portable oven, Bonneville (*Lesobre*), 1937 (*App.* 48.)

Cams:
- For working hammers in making untapped nuts, Marsden, 177.
- For sewing-machines, Vosper & Rogers, 251.
- For rotary engines and pumps, Patrick, 2499 (*App.* 3.)

Candles; candlesticks:
- Candle holders for candlesticks, &c., Zimmermann, 95.
- Machine for making paper wicks, Aspinwall, 249.

Caps (percussion):
- Making, out of steel coated with other metals, Sanders, 330.

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- Non-luminous gases, Kidd (*Arnold*), 66.
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- Air for lighting or heating, Mather, 211.
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Cards:
- Frames for exhibiting, Rideal, 113.

Carpets:
- Operating spiral needles in sewing, Garland, 229.
- Sewing-machine for making, Vosper & Rogers, 251.
- Sewing-machine for stitching, Garland, 2248 (*App.* 51.)
- Overseam sewing-machine for, Boone & Detrick, 2553 (*App.* 3.)

Carriage axles. *See* Axles.

Carriages, carts and waggons (road):
- Wheel guard or safety apparatus for, Bois, 45.
- Material or paper felt for bodies of, Gandy, 52.
- For fire-extinguishing apparatus, Johnson (*Bañolas*), 138.
- Close or open on a pair of wheels, Harvey, 222.
- Wagons for carbonised materials, Weare & Isherwood, 326.
- Arranging self-propelling, worked by steam, Todd, 355.
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- Steps and shaft plates for, Haseltine, (*Keene & Sawyer*), 700 (*App.* 35.)
- Locking or turning round gear for drags, &c., Shanks, 1507 (*App.* 43.)

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Cart tilts. *See* Tarpaulins.

Cartridges and holders:
- Forming cases of metallic, Brookes (*Hobbs & Orcutt*), 125.
- Boxes, usable either on or off the fire-arm, Lee, 131.
- Making cases out of steel coated with metals, Sanders, 330.

Casks:
- For carrying petroleum, &c., Sinibaldi (*Sinibaldi*), 136.
- Preparing & cutting staves for, Thornley & Buxton, 188.
- Filling with beer & carbonic acid gas, Gillman & Spencer, 234.
- Splaying and bending hoops for, Bradshaw, 364.
- Edging and centring wood staves for, Thornley & Buxton, 1518 (*App.* 44.)

Casting and moulding metals:
- Or uniting parts of hammers, Hughes (*Parker*), 60.
- Inscribed plates in lieu of engraving, Mallet, 144.
- Moulds for, inscribed plates or surfaces, Mallet, 144.
- Toothed wheels and other circular articles, Scott, 170.
- Substitute for moulding sand, from slag, Luckenbach, 243.
- Links for chains or cables, Handyside, 376.
- Forming moulds for stereotype plates, Morgan-Brown (*Harding & Johnson*), 2119 (*App.* 50.)

Casting and moulding plastic materials:
- Tiles, &c., Whittaker & others, 73.
- Slag for various purposes, Luckenbach, 243.
- Compounds for, and making flexible casts, Loewenberg, 420.
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Beer (bottling). *See* Bottles.

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- Electric, for railway fog signals, Sington, 57.
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- Last and stretching apparatus for, Cramp, 225.
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- Tap for filling and emptying, Howitt & others, 103.
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- Substitute for carboys, for storing, &c. chemicals, Weare, 252.
- Bidons and drinking bottles or flasks, Pieri & Smith, 342.
- Filling & corking, Haseltine (*Bradford & Ferry*), 484 (*App.* 33.)

Boxes and cases:
- Paper material for making, Gandy, 52.
- Cases for vessels holding liquids, Gee, 111.
- Cartridge boxes, Lee, 131.
- For shipping minerals, Connell, 302.
- Paper, Haseltine (*Cleveland Paper-box Machine Co.*), 1008 (*App.* 38.)

Braces or suspenders:
- Buckle or clasp for, Weldon, 77.
- Fastening for, Pendleton, 337.

Bread and biscuits:
- Ingredients for making, Johnson (*Huyttens*), 445.
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Bricks and building blocks:
- Moulding and expelling air from, Whittaker & others, 73.
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- Pressing and moulding, Durand & Marais, 1534 (*App.* 44.)
- Kiln for burning or baking & working same, Bull, 1977 (*App.* 49.)

Bridges:
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- Sinking cylinders for pier foundations, Munn & others, 419.

Brushes:
- For cleansing carriages, walls, &c, Cheatle, 230.
- Compound for making handles of, Thayer (*Smith*), 2513 (*App.* 3.)

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- Surfaces for steps, &c., Haseltine (*Keene & Sawyer*), 700 (*App.* 35.)
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- Adapting lights & signals to, Johnson (*Lamarre*), 409.

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Cables or ropes. *See* Ropes.

Camp and field equipage:
- Portable camp cooking stove, Tomkins, 114.
- Portable cooking stove and utensils, Dann (*Gervais*), 1741 (*App.* 46.)
- Aerotherm portable oven, Bonneville (*Lesobre*), 1937 (*App.* 48.)

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- Candle holders for candlesticks, &c., Zimmermann, 95.
- Machine for making paper wicks, Aspinwall, 249.

Caps (percussion):
- Making, out of steel coated with other metals, Sanders, 330.

Capstans. *See* Hoists.

Carbonic acid gas. *See* Acids.

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- Non-luminous gases, Kidd (*Arnold*), 66.
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Carding fibres. *See* Spinning (carding).

Cards:
- Frames for exhibiting, Rideal, 113.

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- Operating spiral needles in sewing, Garland, 229.
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Casks:
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- Preparing & cutting staves for, Thornley & Buxton, 188.
- Filling with beer & carbonic acid gas, Gillman & Spencer, 234.
- Splaying and bending hoops for, Bradshaw, 364.
- Edging and centring wood staves for, Thornley & Buxton, 1518 (*App.* 44.)

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- Or uniting parts of hammers, Hughes (*Parker*), 60.
- Inscribed plates in lieu of engraving, Mallet, 144.
- Moulds for, inscribed plates or surfaces, Mallet, 144.
- Toothed wheels and other circular articles, Scott, 170.
- Substitute for moulding sand, from slag, Luckenbach, 243.
- Links for chains or cables, Handyside, 376.
- Forming moulds for stereotype plates, Morgan-Brown (*Harding & Johnson*), 2119 (*App.* 50.)

Casting and moulding plastic materials:
- Tiles, &c., Whittaker & others, 73.
- Slag for various purposes, Luckenbach, 243.
- Compounds for, and making flexible casts, Loewenberg, 420.
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Casts:
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5. Index of Subject-matter to Chronological and Descriptive Index from January 1 to February 6, 1875, and to Appendixes from February 7 to August 6, 1875.

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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 7 to February 13, 1875.

A.D. 1875, February 8.—No. 465.

BURY, Samuel, of Accrington, in the county of Lancaster.—" Improvements in the construction of " self acting temples used in weaving."

The invention relates to the construction of that class of self acting temples used in power looms for weaving, which consist of a revolving roller extending across the whole width of the piece, and provided with a number of points or needles at or near each end for entering and distending the selvage of the cloth.

A.D. 1875, February 8.—No. 466.

SMITH, James, engineer to Messieurs Walter Crum and Company, of Thornliebank, in the county of Renfrew, North Britain.—" Improvements in mechanical stoking apparatus for boiler and other " furnaces."

In carrying out the invention there is fitted at the mouth of the furnace a hopper, at the bottom of which two short screws are fitted for the purpose of applying a positive pressure inwards to the fuel. The fire bars which are disposed longitudinally are made and placed with a general downward inclination towards the inner end of the furnace, but they have at each of two points a more or less abrupt drop, and at these points apertures are formed through which two series of rods or pokers can project inwards over the lower parts. The rods or pokers are connected to a rocking shaft or are made to reciprocate.

A.D. 1875, February 8.—No. 467.

GREENWOOD, Frederick Alexander, of Ilkley, in the county of York.—" Improvements in ma- " chinery employed in spinning silk, cotton, wool, and other fibrous substances."

Improvements on the twisters named in Specification No. 1000, A.D. 1872.

The " twister " has a socket in which the spindle end is fitted to slide freely, and its position is regulated by a set screw. At the end of each twister there is an eye through which the material is passed.

A.D. 1875, February 8.—No. 468.

MARTIN, Thomas, of Box Grove, Guildford, in the county of Surrey, Lieutenant-Colonel late commanding Fourth the King's Own Royal Regiment.—" Improvements in lamps."

This invention relates to oil lamps, such as those described in Tandy & als. Specifications, Nos. 648 and 3540 of 1872. According to one of the improvements the air tubes to the burner are extended up to the top of the lamp casing, passing in notches at the back of the oil tank and communicating with an air chamber formed outside the casing. Air holes are made in the casing below the oil tank to allow of a current of air to cool the tank.

According to another improvement the air tubes communicate with a small air chamber formed either on the top of the reflector or outside the casing at the level of the reflector. This chamber has holes for the admission of air which enters it from holes made in the lamp casing at some distance from the chamber.

The latter improvements are also applicable to the patentee's former patents, Nos. 3247 and 3838 of 1874.

A.D. 1875, February 8.—No. 469.

HOLROYDE, Walter James, late of Philadelphia, Pennsylvania, now residing at Halifax, in the county of York, engineer.—" Improvements in grapples for dredgers."

The object of this invention is to simplify the construction of that class of apparatus employed for excavating under water, which consist of jaws to be opened when lowered to the material to be removed, and then closed so as to seize the material prior to being raised.

A.D. 1875, February 8.—No. 470.

COOPER, John Harris, of Rotherby, CLARKE, Thomas Alfred William, of Leicester, and CORAH, Edwin, of Leicester, all in the county of Leicester.—" Improvements in knitting machines."

This invention has for its object to produce automatically striped work (either ribbed or plain) upon circular knitting machines. For this purpose we combine with an ordinary circular knitting machine apparatus for automatically acting upon two thread guides or layers in such manner that one thread guide shall be thrown out of action at the same instant that the other thread guide is thrown into action, and also apparatus for automatically cutting the thread that is thrown out of action, and for holding the end of such thread until it is again to be laid on to the needles.

A.D. 1875, February 8.—No. 471.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from David Munson Osborne, of Auburn, New York, United States of America.*)—" Improvements in harvesting machines."

My present invention relates to further improvements in the rakes and rake operating mechanism described in the Specification of former Letters Patent, dated February 19th, A.D. 1872, No. 537.

A.D. 1875, February 8.—No. 472.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from John Bernard Larkin, of Pittsburg, Pennsylvania, United States of America.*)—" Improvements in furnace grates and in apparatus connected therewith."

This invention relates to a series of movable grate-bars sustained at each end upon cross bars having tongues fitting into longitudinal grooves in said grate-bars. The grate-bears are pivoted to a rocking bar which is fulcrumed in the centre of the grate. On moving said rocking bar on its fulcrum the grate bars vibrate longitudinally, their ends keeping parallel with the rocking bar. The tongue on the cross bars remaining stationary, forming as it were a fixed continuation of the grate bars, the movement of the latter does not create an opening or space at their ends to permit the passage of fuel. So, too, the longitudinal movement of said grate-bars increases or diminishes as desired the spaces between said bars, thus controlling the draught. The grate-bars may extend either longitudinally, obliquely, or transversely of the grate, the rocking bar crossing them at right angles, and instead of forming tongues on the cross-bars the same may be grooved and the tongue placed on the grate-bars, or the grate-bars may be hollow and the ridges be changed to studs, which will slide or telescope thereinto.

A.D. 1875, February 8.—No. 473.

CLARK, William, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Dieudonné François Lontin, of Paris, France.*)—" Improvements in the application of " electro dynamic machines for obtaining metals from their salts, regenerating galvanic batteries, " and obtaining other chemical reactions."

The invention consists, first, in the utilization of the whole of the electricity produced by an electro dynamic machine for decomposing metallic salts from which it is desired to obtain the metal.

2ndly. In obtaining most of the metalloids by dynamo-chemical decomposition.

3rdly. In producing organic and other chemical products by like means.

4thly. In regenerating spent galvanic batteries by a current from an electro dynamic or dynamo-chemical machine.

A.D. 1875, February 8.—No. 474.

WILSON, Thomas William, of the firm of Wilson & Co., grocers and wine merchants, of Woodbridge in the county of Suffolk.—" Improvements in apparatus or machinery for cleaning bottles."

My said invention relates to apparatus or machinery for cleaning or washing bottles, and consists in various novel contrivances whereby this operation is effected in a more expeditious, economical, and satisfactory manner than has heretofore been practicable. My improved apparatus or machine has a large central toothed wheel geared with pinions arranged around the said central wheel. Each of the said pinions is fitted with a bottle brush. In connection with the above described machine I employ racks and a vat or tank containing water. Or instead of the above I use a portable tank in which rotates a wheel with divisions to receive bottles.

A.D. 1875, February 9.—No. 475.

BROOKS, Henry, the younger, of the firm of H. Brooks & Company, of Cumberland Market, Regent's Park, the Hampstead Road, and Lyme Street, Camden Town, all in the county of Middlesex. —" Improvements in inkstands."

The invention relates to means of supplying the dipping cup of inkstands by the action of flexible diaphragms.

A.D. 1875, February 9.—No, 476.

BROOKS, Henry, the younger, of the firm of H. Brooks & Company, of Cumberland Market, Regent's Park, the Hampstead Road, and Lyme Street, Camden Town, all in the county of Middlesex. —" Improvements in call or signal bell apparatus."

The invention relates to arranging the parts of call or signal bell apparatus (such as are set in motion by the unwinding of a spring) so that the winding up of the spring and the release of the hammer as desired may be effected from the top of the bell, and thereby the application of the bell apparatus to paper weights and other surfaces may be facilitated.

A.D. 1875, February 9.—No. 477.

SCHREBLER, Gustav, of Guben, in the Kingdom of Prussia.—" Improvements in the construction " of pistons for rotary engines and pumps, and in parts connected therewith."

Shaft is below centre of cylinder, and has a fixed guide cylinder in which the piston works; to compensate for wear and tear at ends of the piston a packing disc is interposed between piston and cover, which disc can be set up.

A.D. 1875, February 9.—No. 478.

LAYCOCK, William Samuel, of Sheffield, in the county of York, manufacturer.—" An improved " mode of applying breaks to railway engines and carriages."

My invention consists in the use of electricity or magnatism for applying the breaks to railway engines and carriages, or to machinery by which the said breaks are applied.

A.D. 1875, February 9.—No. 479.

CORDILLOT, Honoré François Adolphe, of Sepouchoff, near Moscow, in the Empire of Russia, calico printer, and **MATHER, William**, of the firm of Messieurs Mather and Platt, of Salford, in the county of Lancaster, engineer.—" Improvements in apparatus for steaming printed fabrics."

Our improved apparatus consists of a brick or other chamber, the roof of which is lined with a curved steam jacket connected by side pipes to a perforated pipe near the floor. At each end of the chamber is an opening closed by a steam tight door, through which openings the waggons for the fabrics are admitted and discharged. The fabric is fed into the chamber and delivered by rollers into waggons supported upon inclined rails.

A.D. 1875, February 9.—No. 480.

BRADLEY, Christopher, machine wool comb maker, and **CAMPBELL, John**, commission wool comber, both of Bradford, in the county of York.—" Improvements in machinery for combing wool " and other fibres."

This invention relates to employing two or four circular nips fitted between an ordinary comb or other circular rotary comb and an inner smaller circular comb; the nips bring the tufts from the outside feeding comb to the inner smaller circular comb, leaving clean fringes or fibres inside the circle of the teeth or pins and leaving the noils on the outside; drawing off rollers & dabbing brushes are employed; or the inner circular comb can be used for feeding and the outside circular comb for delivering.

The circular racks are made of homogeneous malleable iron on which fit brass circles having the teeth or pins.

A.D. 1875, February 9.—No. 481.

LEE, Joseph William, of Number 9, Emmanuel Road, Cambridge, in the county of Cambridge, engineer.—"Improvements in rotary pumps."

The features of novelty consist in so arranging the interior as to do away with the necessity for cams or eccentrics.

A.D. 1875, February 9.—No. 482.

JONES, Thomas, of Harewood, Calstock, in the county of Cornwall, Clerk in Holy Orders.—"Improvements rendering timber for building and other purposes impervious to dry rot and decay, also rendering the same uninflammable."

The object of this invention is to render timber for building and other purposes impervious to dry rot and decay and also uninflammable. This is done by impregnating the timber with a hot solution of tungstate of soda. The solution should be of a certain specific gravity. Subsidiary details are described in the Provisional Specification.

A.D. 1875, February 9.—No. 483.

DEVENPORT, Cornelius, of Birmingham, in the county of Warwick, of the firm of William Devenport, stamper and piercer and fancy jewellery manufacturer.—"Certain improvements in the construction and manufacture of crotchet hooks and handles, to be used single or duplex, and which said improvements are also applicable for other purposes."

The object of my invention is the more securely connecting crotchet hooks with their respective handles, and protecting the same by sliding them (when out of wse) within the range of the handle, and the use of the said appliances for other like purposes.

A.D. 1875, February 9.—No. 484.

HASELTINE, George, of the International Patent Office, Southampton Buildings, London, Doctor of Laws.—(*A communication from Jeremiah Bond Bradford, of Boston, Massachusetts, and George Harrison Ferry, of the city and state of New York, both in the United States of America.*)—"An improved apparatus for filling bottles with liquids, and for corking the same."

The said invention consists in a series of measuring receptacles connected with the supply reservoir, and provided with valves that control their inlet and outlet passages; each receptacle is provided with a central passage or tunnel extending vertically through it, and each receptacle is of the exact capacity of the bottle to be filled; a number of bottles coresponding to that of the receptacles being brought up in a box or carrier, so as to cause the neck of each bottle to fit snugly into the bottom of its tunnel a short distance below the junction of the outlet passage therewith, the tunnels also serving as conductors for the corks, which after the bottles are filled are pressed down into their necks by the simultaneous desent of a series of plungers connected together to perform the operation of corking.

A.D. 1875, February 9.—No. 485.

HASELTINE, George, of the International Patent Office, Southampton Buildings, London, Doctor of Laws.—(*A communication from Edwards Stevens Winchester, of Boston, and Henry Willis Phelps, of Springfield, both in the state of Massachusetts, United States of America.*)—"Improvements in rock drilling machines, parts of which invention are applicable to other machinery."

This invention consists, first, in placing the packing within a groove extending around the interior of the cylinder; also in securing the sections of the cylinder together by bolts or otherwise, and in forming shoulders at the ends of the sections; also in a channel or channels extending from each end of the sectional cylinder to the packing; also in a novel construction and arrangement of the valve and ports of a rock drill engine; also in a piston having a long bearing surface; also in providing the valve of a rock drill engine with an elastic or spring arm; also in placing the action of the drill at all times under the complete control of the operator in a more simple and effective manner than heretofore; also in providing elastic buffers outside the cylinder; and also in interposing an elastic washer or spring between a projection or shoulder on the feed screw and the plate by which its rear end is supported.

A.D. 1875, February 9.—No. 486.

LAKE, William Robert, of the firm of Haseltine Lake & Co., patent agents, Southampton Buildings, London.—(*A communication from Charles Herman Knelles, of the city and state of New York, United States of America,*)—" An improved process and apparatus for producing imitations of leather " and textile and other fabrics or materials."

This invention consists in a process for preparing the moulds to be used in producing imitation leather, morocco, damask, and such other fabrics as are referred to in the Specification of Letters Patent granted to William Bell, the sixteenth day of December, 1874, No. 4343; and for producing the fabric from such moulds.

A.D. 1875, February 10.—No. 487.

WHYTE, Andrew Clark, of Glasgow, in the county of Lanark, North Britain.—" A new or improved " apparatus or means for saving life from shipwreck."

The feature of novelty which constitutes this invention is the arrangement and construction of the apparatus.

A.D. 1875, February 10.—No. 488.

TROTTIER, Emile, one of the firm of Trottier, Brothers, and Co., ironmaster, of Hennebout, department of Morbihan and Republic of France.—" An improved process of removing grease in the manu- " facture of tin-plates or terne-plates, and improved apparatus in connection therewith."

This invention relates to an improved process and apparatus for removing from tin and terne plates the grease used in the process of manufacturing them, and at the same time polishing the plates.

The sheet covered with grease is introduced through a slit into a case, where it is seized by two rollers, which pass it between two cylindrical brushes revolving at great speed in a compartment containing flour constantly fed in from a hopper above the brushes; leaving the brushes, the sheet passes into a guide and thence between two other rollers. The sheet on leaving these latter rollers is freed from grease, but being still sprinkled with particles of flour is passed into another apparatus, differing from the first, only by substitution of skin or leather covered rollers for the brushes, and is then finally polished. The flour is carried by an endless cloth into a back compartment of the case or trough, and is constantly raised to the hopper by an archimedian screw or other elevator. The apparatus works continuously and automatically.

A.D. 1875, February 10.—No. 489.

HEARD, John Reed, of Boston, in the county of Suffolk and state of Massachusetts, U.S. of America. —" Improvements in the manufacture of horseshoe and other nails."

This invention consists in making horse shoe and other nails from improved nail-plates that are provided with parallel ridges on one or both sides produced by hot rolling, between which ridges is produced by cold-rolling a groove midway between the ridges of a sectional shape equal to a pair of finished nails laid point to point. From this improved nail-plate the nails are made by punching only without any other manipulation, save the stamping or pressing of the head if ridges are used on both sides of the nail plate.

A.D. 1875, February 10.—No. 490.

VALLET, Leon, of Liverpool, in the county of Lancaster.—" Improvements in stoppers for bottles " for containing aërated or gaseous liquids, and in apparatus employed for bottling such aërated or " gaseous liquids."

This invention consists, firstly, of an internal stopper, being a short stem, one end of which being the top thereof, is formed with a head of size to pass through a bottle neck; the other end or bottom of the plug developes into a hollow cone, the base of which is of diameter equal to the head of the stopper. At the apex of the cone there is a groove or cap so made as to hold an india rubber washer, which covers the surface of the cone. Stoppers are by preference of metal, and so made that the head being the heaviest part thereof, the stoppers always fall in position for stoppering, namely, with the head downwards, the cone and india rubber washer effectually stoppering the bottle. Secondly, a bottling apparatus being a frame, which carries a reversible bottle holder so that the bottle may be inverted after filling to allow the internal stopper to fall into position.

A.D. 1875, February 10—No. 491.

SWARBRICK, Robert, of Manchester, in the county of Lancaster.—" Improvements in the construc-" tion of fire proof flooring."

The object of this invention is to make a strong economical and shallow fire proof flooring with a plain flat ceiling.

The invention consists principally of a peculiar combination of wrought iron or steel girders or joists supporting a series of slabs or tiles of stone ware or other suitable material to form the ceiling and filled in with concrete to form the floor.

A.D. 1875, February 10.—No. 492.

JONES, Harry Langston, of Webster's Hotel, Ely Place, Holborn, in the county of Middlesex, civil engineer.—" Improvements in solid and liquid disinfectants and deodorizers."

This invention relates to disinfecting powders and solutions, and consists in a combination or mixture of mineral sulphates and chlorides of the earthy salts, especially the combination of sulphate of zinc with chloride of sodium or of calcium.

The salts are powdered and mixed in the proportions of 10 per cent. of sulphate of zinc to 90 per cent. of chloride of calcium.

For liquid disinfectants this same powder is dissolved in water in the proportions of 1 pound of the powder to each gallon of water, and it is coloured by the addition of a small quantity of aniline blue.

A.D. 1875, February 10.—No. 493.

MIDDLETON, William, and **HAYWARD, Phillip**, both of Leeds, in the county of York.—" Im-" provements in the means or apparatus employed in melting, refining, converting, and puddling " iron."

Between ordinary puddling furnace and chimney there is a retort for containing the cast metal before conveying it to puddling furnace, the metal in retort being heated by waste heat from puddling furnace. For refining we introduce a blast into retort.

A.D. 1875, February 10.—No. 494.

JENSEN, Peter, of Chancery Lane, London. — (*A communication from Hermann Baumotte, of Düsseldorf, in the German Empire.*)—" Improvements in painters' easels."

Hand rest or ruler is suspended in steel bands passing over pulleys on the drawing board and counterweighted; the drawing board is suspended in a cord passing over a pulley on the easel and counterweighted.

A.D. 1875, February 10.—No. 495.

COLE, Samuel, of Edgbaston, in the county of Warwick, manufacturer.—" New or improved compo-" sitions for making inkstands, picture frames, watch stands, black and coloured jewellery and " ornaments, dress fastenings, and other articles."

This invention consists of compositions made and treated in the following manner.

For a black composition the following materials are taken—

12 parts by weight of gas tar or tar varnish.
12 parts by weight of whiting, or chalk, or clay; and,
12 parts by weight of lamp black or vegetable black.

These materials having been thoroughly mixed and converted into a plastic or pasty mass, the mixture is consolidated and hardened by rolling and drying. To give toughness to the composition short pieces of fibrous materials may be introduced into the composition.

The articles are made from the composition by stamping them in stamps or presses and varnishing and polishing them.

For a coloured composition transparent varnish or the waste or refuse of transparent varnish is used in place of gas tar or tar varnish and in addition to the whiting or chalk or clay a powdered pigment of the required colour is used.

A.D. 1875, February 10.—No. 496.

DAW, Mary Weldon, wife of Samuel Daw, of 1, Parade, Tredegarville, Cardiff, in the county of Glamorgan.—" Improvements in or additions to scissors."

This invention consists in forming on scissors (by preference at the point end of the blade) hooks, the edges of the said hooks being either blunt or sharp.

A.D. 1875, February 10.—No. 497.

MARILLIER, Robert Aspland, of the town or borough of Kingston upon Hull, in the county of the same town or borough, civil engineer.—" Improvements in apparatus for raising, tipping, and " lowering trucks."

This invention relates to apparatus consisting of two hydraulic lifts placed by the side of a quay. The one has a platform on which a loaded truck is raised, with swivelling rails for tipping the truck by means of a chain worked by the ram of an inverted hydraulic cylinder. The other platform when empty is raised by hydraulic pressure, but when it receives the empty truck it descends, forcing back the water, the speed of descent being regulated by a governing valve. Between the lifts is a space where is arranged the shoot for delivering the contents of the trucks into a vessel alongside the quay. Over this space the trucks are run on rails from the one platform to the other, and such trucks as open at bottom are there discharged.

A.D. 1875, February 10.—No. 498.

HOLLIDAY, Thomas, of Huddersfield, in the county of York, manufacturing chemist.—(*A communication from Alexandre Schultz, of Paris, in the Republic of France.*)—" Improvements in operating " with indigo in the printing of cotton and other fabrics."

The invention relates to fixing coloring matter when employing indigo in the printing process by a steaming process, and consists in the use of indigo white and oxide of tin or salts of tin and an alkali and gum for the purpose.

A.D. 1875, February 10.—No. 499.

HOLLIDAY, Thomas, of Huddersfield, in the county of York, manufacturing chemist.—(*A communication from Alexandre Schultz, of Paris, in the Republic of France.*)—" Improvements in effecting the " bleaching of cotton and other fabrics produced from vegetable fibres."

The invention relates to effecting the desired bleaching of the fabric without the necessity for the use of caustic lime, as at present adopted.

The fabric is submitted successively to the action of a weak solution of hydrochloric acid, to a washing and boiling in solution of resin soap, to chloride of lime, to a further weak solution of hydrochloric acid, with washings in water between the operations. Some of the processes may be repeated, and the proportions and relations may be varied.

A.D. 1875, February 10.—No. 500.

SNELUS, George James, of Workington, in the county of Cumberland, manager of the West Cumberland Iron and Steel Works.—" An improved process for extracting copper, silver, and other metallic " compounds, from solutions, and for separating the metals."

My invention for the treatment of solutions relates to the separation of the silver and gold as well as to the precipitation of the copper contained in such solutions, whether obtained directly from ores or otherwise.

A.D. 1875, February 10.—No. 501.

PETIT, Henry Joseph, of Brussels, in the Kingdom of Belgium, manufacturer.—" Improvements in " sewing machines."

This invention relates to that class of sewing machines in which certain parts of the mechanism, such for example as the neeedle bar, presser foot, and feeder, have imparted to them a relative rotary motion, whereby the necessity for moving the material in working and embroidering in any pattern with the chain stitch is obviated, since the parts of the machine themselves follow the desired outline simply by the act of working the crank placed under the table of the machine. The invention consists of a peculiar combination of parts by means of which this principle which has hitherto been applied to embroidering machines only may be carried out with sewing machines in general, so as to obtain a feed in every direction, also to embroider with either the chain stitch or the plain or quilting stitch upon the braid, and it may be applied to embroidering machines, chain stitch, single or double thread, or shuttle machines, or to sewing machines of any other description.

A.D. 1875, February 10.—No. 502.

ACKERMAN, Bernard, of the city of New York, in the county and state of New York, United States of America.—" Improvements relating to the preparation of fertilizers."

This invention relates to the preparation of stable manure in city stables by a cheap and expeditious process of forming in bales by simple compression and banding.

A.D. 1875, February 11.—No. 503.

KIRBY, William, of St. Peter's Street, Derby, in the county of Derby, basket maker.—" Improvements in coffins."

The invention relates to forming coffins of various descriptions of basket work on a wooden bottom or frame, and securing the lid to the body of the coffin by metal bands, soldered or sealed to prevent illicit opening, which bands also serve to receive inscriptions.

The object being to obtain a light and economical coffin and one which will facilitate the decomposition of the deceased.

If required these coffins may be made water tight.

A.D. 1875, February 11.—No. 504.

WIER, Marshall Arthur, of 33, Abchurch Lane, in the city of London.—" Improvements in " apparatus for measuring the flow of liquids."

The invention consists, as regards liquid meters in which a spiral vane or screw is employed, in arranging a series of guide vanes or curved passages for guiding the liquid on to the vane or screw at the most advantageous angle.

As regards liquids meters in which reciprocating pistons are employed, in arranging a piston or plunger with a valve which remains closed, whilst the piston or plunger is being urged forward by the liquid, but opens to allow the liquid to pass through the body of such piston or plunger during its return stroke. Instead of a valve being adapted to the piston, the piston itself is, according to one modification, caused to remain in a position transverse to the direction of motion of the liquid during its forward stroke, but to turn edgewise towards the current during its return stroke.

In another modification a series of pistons or vanes mounted on spindles radiating from a central axis rotate in a chamber by the action of the liquid, such pistons or vanes being opened out whilst traversing the acting part of such chamber and folded up or feathered whilst traversing the other or neutral part of such chamber.

A.D. 1875, February 11.—No. 505.

BRUNNER, Wilhelm Georg, of No. 53, Gracechurch Street, in the city of London.—(*A communication from Messrs. Schnabel and Henning, of Bruchsal, in the Empire of Germany.*)—" A new or improved " self-acting counterbalancing apparatus for portable cranes."

The invention consists of an arrangement of levers and connecting rods or links in connection with the jib, whereby the load suspended to such jib is caused to shift a moveable weight into such a position behind the centre or pivot of the crane as to counterbalance the said load suspended to the jib in front of such centre or pivot.

A.D. 1875, February 11.—No. 506.

JENSEN, PETER, of Chancery Lane, London.—(*A communication from Emil Bürgin, of Basle, Switzerland.*)—" Improved mode of and means for increasing the adhesion of locomotive wheels on rails."

Locomotive driving axle is covered with coils of insulated copper wire, the wheels being the poles of a powerful electro magnet.

A.D. 1875, February 11.—No. 507.

BROADFOOT, JAMES, of Glasgow, in the county of Lanark, North Britain, engineer.—" Improvements " in water closets."

In one modification suitable for houses or ships the bottom and outlet of the closet basin is cemented into the top of a hemispherical metal shell, which is bolted to a reverse hemispherical part formed at the top of the soil pipe. The valve or closing detail is a segmental spherical shell inside the spherical casing, and closing up against the top opening into the casing In the second modification which is more especially designed for ships, the upper part of the valve casing is the same as in the first modification, and is fitted with a similar segmental spherical valve. The mouth or top of the soil pipe is enlarged to receive a second valve, which is, however, arranged so as to require no additional joints in the casing. An inclined valve seat is fixed down on flanges or snugs formed for it inside the casing or enlargement, and a flap valve is fitted to close against the underside of the valve seat.

A.D. 1875, February 11.—No. 508.

WOOD, GEORGE RESTON, of the Wishaw Iron Works, in the county of Lanark, North Britain.—" Improvements in and connected with steam boiler and other furnaces."

This invention consists in constructing or arranging the furnace and parts connected therewith, so that the air for combustion is supplied by a fan, pump, or other forcing apparatus to the lower part of a column of fuel, whilst the fire gases or gaseous products of combustion can pass off from the bottom or lower part of such column.

A.D. 1875, February 11.—No. 509.

HUTCHINSON, WILLIAM NELSON, of Wellesbourne, near Bideford, in the county of Devon, General in Her Majesty's Army.—" An improved stirrup."

The invention consists in the adaptation of an extensible step to a stirrup to facilitate the mounting of a high horse.

The step is fitted to slide within the legs of the stirrup and is retained in position by spring catches and closed by means of springs when the catches are released by the pressure of the foot of the rider.

A.D. 1875, February 11.—No. 510.

JONES, WILLIAM PALMER, of Birmingham, in the county of Warwick, gun maker.—" Certain improvements in breech loading fire arms."

According to my invention the barrels are constructed with an extended lump thereon, which projects from the underside of the breech, and this is caused to take into a suitable slot provided in the false breech or body of the action, and is held therein when the barrels are closed by a bolt taking into or over it.

With this arrangement of securing the barrels I combine a second bolt for the sake of greater security, which works upon the same frame, and is connected to the lower or first mentioned bolt by a small pin, the said last mentioned bolt taking into a recess provided under the rib of the barrels, and thus both of the said bolts being on the same frame are actuated by the same movement, and are caused to fly into their respective grooves at the same moment, and I thus obtain a motion upon closing or locking the barrels which is free from jarring, and very even in its effect.

A.D. 1875, February 11.—No. 511.

SCHOFIELD, CHRISTOPHER JAMES, of Clayton, near Manchester, in the county of Lancaster, manufacturing chemist.—" Improvements in furnaces and apparatus connected therewith for the " manufacture of alkalies, the puddling of iron, the roasting of ores, and other purposes."

The first part of this invention relates to furnaces intended for operations in which the materials under treatment are required to be stirred or agitated, and consists in the application and use, in combination with an annular rotating bed, of an improved construction of stirring apparatus arranged to facilitate the changing as required of the stirring implements which are raised and lowered by means of pinions and racks carrying a frame in which are arranged the actuating wheels of the spindles carrying the stirrers or agitators, the whole being so arranged as that during the lowering operation the stirrers or agitators are set in motion before coming in contact with the materials to be operated upon in the annular bed.

The second part of the invention relates to furnaces intended for puddling iron and for other processes requiring an intense heat, and consists in the adaptation and use, in combination with a rotating annular bed or trough, of a chamber or vessel in which water is caused to circulate in contact with the outer portions of the rotating annular bed or trough in such manner as to prevent its being injured by excessive heating.

The third part of the invention has reference to furnaces designed for the roasting of ores and other analagous purposes, and consists in the application and use in combination with a rotating annular bed of plates or deflectors arranged in series parallel to each other but in an annular direction relatively to the course of the rotating annular bed in such manner as at each rotation of the annular bed to change the position of the particles of ore or other material under treatment in the bed, and not only to turn over such particles of ore or other material, but also to move the entire contents of the annular bed nearer to the opposite side to that at which such material under treatment was originally fed in, and finally to cause the material, after due treatment, to pass out of the furnace..

A.D. 1875, February 11.—No. 512.

DUMONT, Albert, and **ALFIERI**, Eugène, both of Castle Street East, Oxford Street, in the county of Middlesex.—"Improvements in the construction of lockets."

The features of novelty of this invention consist in constructing lockets with leaves revolving on a pin having a secret fastening, two of the said leaves being locked together by means of a small ball, which is made to pass by a certain motion given to the locket from one cell to another in order to open the secret part of the said locket.

A.D. 1875, February 11.—No. 513.

CLINKER, Charles, of Yeovil, in the county of Somerset.—"Improvements applicable to printing "machines."

This invention mainly consists in arrangements of printing machinery whereby an ordinary table printing machine can be fed automatically from a reel, as at present used in connection with rotary printing machines. Arrangements for cutting the sheets and also working details for passing same through the machine to the cylinder are described in the Provisional Specification.

A.D. 1875, February 11.—No. 514.

CLARK, Josiah Latimer, and **STANDFIELD**, John, both of 5, Westminster Chambers, Victoria Street, Westminster.—"Improvements in floating docks and pontoons, and in blocking or securing vessels."

This Provisional Specification describes so forming floating docks or pontoons that they may be employed for raising vessels out of the water and depositing them high and dry on fixed stages. The docks consist of two sides composed of a series of vertical tubes and of a bottom composed of a series of transverse horizontal tubes. The bottom of the dock is by preference permanently attached to one of these sides, but the other is movable. A series of rows or piles is driven into the water, each row being connected at top by longitudinal timbers, and the width or space between each row corresponds with the width of the horizontal tubes of the dock, so that the whole series of tubes with the vessel upon them may be floated in between the piles and lowered, leaving the vessel upon the piles.

The Specification also describes an improved method of shoring vessels. The base block is drawn in under the vessel in the usual way. The base block carries two shores hinged upon it, which are connected at top by a chain carrying blocks of wood or rollers which fit against the side of the ship and adjust themselves to its form.

An improved block for supporting ships is also described, consisting of a cylinder closed at the bottom and having a piston working within it. The cylinder is filled with sand and the piston rests on the sand. The sand can be removed through holes, and the piston is thus lowered.

A.D. 1875, February 12.—No. 515.

DIGNUM, Forbes Bowerbank, of No. 18, Austin Friars, in the city of London.—"Improvements in "breakers or water casks for boats."

According to this invention boats' breakers are made of iron with one end surface to unscrew and with the bung hole in the other end surface. Iron handles are also provided at the ends for persons to lay hold of when the breaker is used as a life buoy.

A.D. 1875, February 12.—No. 516.

PEARSON, David Ritchie, of Kensington, in the county of Middlesex, Doctor of Medicine.—"Improvements in backs and handles for brushes."

According to this invention it is proposed to make the backs and handles of toilet brushes of all kinds of what is known as "toughened glass," that is to say glass which has been heated and subsequently cooled in oil. If desired the holes for the reception of the hairs or bristles may be cast or moulded in the said backs, or they may be drilled therein as found most expedient.

A.D. 1875, February 12.—No. 517.

CRAWLEY, William, of Ballymarcanlon, Dundalk, Ireland.—"Improvements in ships for the "purpose of preventing sea-sickness."

A well is formed amidships of the vessel, wherein a saloon is suspended working on pivots in an iron frame. At the head and foot of the well (which is preferably of an oblong shape) grooves are formed wherein wheels work easily up and down, such wheels being affixed to the iron frame surrounding the saloon. Perforations are made in that portion of the ship's bottom immediately beneath the well to allow of the influx and reflux of the water, and to obviate the ship's speed being retarded by the water within the well a double cut-water is provided in the bottom thereof, which serves to divide the body of water within the well in whatever direction the vessel's course may be set.

A.D. 1875, February 12.—No. 518.

MILBURN, Robert, of Hatcham Iron Works, Pomeroy Street, New Cross Road, in the county of Surrey, and **JACKSON,** Henry, of 16, Park Square, Leeds, in the county of York.—"Improvements "in the method of and in apparatus for drying, calcining, roasting, or incinerating soda-ash, sulphate "of soda, and carbonate of potash, and ores of sulphur, copper, zinc, and lead, and applicable also in "the treatment of other salts, ores, and substances."

The inventors employ a travelling chain of scrapers to move the substances along a bed over which the flames from a furnace pass. The bed is supported on beams, so that the chain can return below the said bed. Some of the scrapers are caused to revolve in bearings in the chain links. The chain has a to and fro motion in addition to its progressive movement.

A.D. 1875, February 12.—No. 519.

TERRELL, Thomas, of Penarth, Cardiff, in the county of Glamorgan.—"Improvements in the manufacture of tin plates."

My invention consists in covering the iron plates immediately after they have been properly pickled with a thin deposit of any metal which will flux with tin by the electro-typing process, to prevent the immediate formation of oxide on the plates, and the peculiarity of my process consists in the combination of the electro-typing with the ordinary dipping process.

The plates are then plunged into molten tin and drawn out through rollers and thus formed into tin plates, ready for packing, without further process.

To prevent the oxidation of the molten tin I place in the pan containing it a quantity of palm oil only sufficient to produce a film on the surface of the tin.

A.D. 1875, February 12.—No. 520.

SMITH, Henry Norris, of the firm of Smith and Wellstood, of Glasgow, in the county of Lanark, North Britain, stove and range manufacturers.—"Improvements in apparatus for heating water for "baths or for other purposes."

The invention consists in providing a supplementary heater in connection with an ordinary open kitchen boiler, such supplementary heater being arranged so as to be heated altogether or for the most part by the steam generated in the open boiler. This supplementary heater is a box of copper or other suitable metal or material connected by two pipes with the bath or cistern containing the water to be heated.

A.D. 1875, February 12.—No. 521.

KELLY, STEPHEN JOSEPH JAMES, of Cubitt Town, in the county of Middlesex, glass tablet writer.—" Improvements in producing letters or other devices upon glass."

To produce an illuminated effect on glass, the back of the portion of the glass upon which the letters or devices have to be produced, is covered with any desired ground or "field" leaving the letters blank or uncovered. Over these blanks are placed thin pieces of mother of pearl, or of other luminous shell, fastened by any suitable transparent cement.

To produce an embossed effect, the letters are painted on the back of the glass with any suitable transparent varnish, and when dry are gilt.

AD. 1875, February 12.—No. 522.

KOSMINSKI, MARTIN, of No. 36, New North Road, in the county of Middlesex, furrier.—" Improvements in certain articles of dress for ladies."

The invention relates to forming boas, tippets, and other neck protectors with a spring therein, bent somewhat to the configuration of the neck, so that the article may be held to the neck simply by the elastic force of the spring without the necessity for other fastening. A victorine or tippet is sometimes combined with a boa thus arranged.

A muff, muff-bag, or other bag, is sometimes connected so as to be suspended to the hanging ends of such neck protector by swivel or such like means.

And the fastening of the mouth of a muff-bag is from the interior of the muff, so as to offer increased facility against illicit opening.

A.D. 1875, February 12.—No. 523.

LASLETT, THOMAS NEWNHAM, of No. 97, Maryon Road, Charlton, in the county of Kent, architect.—" Improvements in instruments for measuring the heights and distances of objects."

This invention consists of an index arm pivotted at one end to a scale plate, the free end traversing round scales marked on a segment of the plate. The line of sight is directed along the arm from the free end to the pivot, and is wholly and partially intercepted by a reflector placed over the pivot at an angle of 45° to the line of sight. The plate is adjusted in a vertical position by spirit levels, and the index arm is vertical when the index is at zero. The instrument is adapted to be used for horizontal dimensions also.

A.D. 1875, February 12.—No. 524.

HOWLAND, RICHARD, of Folkestone, in the county of Kent.—" Improvements in the combination of " perpetual almanacs or calendars with pencil-cases, pen-knives, and other articles of utility."

In the instance of a pencil-case of circular section, the numbers of the days of a month (up to thirty one) are engraved, impressed, or painted in consecutive order in parallel rows and arranged in seven vertical columns beginning at No. 1, and ending at No. 31, either on the exterior of the pencil-case, or on a tube passed over the same. Above the tablets thus arranged is placed a tube or collar, on which the initial letters of the several days of the week are engraved, impressed, or painted. The almanac or calendar is set for one month by turning until the initial letter of the day of the week is above the number which indicates the first day of the month. The edges of the tablets and of the tube or collar are serrated or otherwise shaped as to enable the latter to retain its relative position after being set. The tube or collar is kept in position by a moveable cap. These arrangements are also applicable to articles of polygonal section.

A.D. 1875, February 12.—No. 525.

ALLAN, GEORGE, civil engineer, and **BROWN, JAMES WALLACE**, electrician, both of 18, Leadenhall Street, London.—" Improvements in electric telegraphs."

The main objects are (1), to record dots and dashes sent through submarine cables at a superior speed; (2), to translate or retranslate signals from one circuit to another at a superior speed; and (3), to relay or retranslate from land to submarine or insulated line without sending land line circuit through cable line or vice versa.

The improvements consist:—

First. In constructing what we call a contact, preferably of a metal bar provided with adjustable insulated platina discs or stops. The said bar is free to move in bearings, so as to be acted upon by an armature.

Second. In a disc free to revolve in bearings, preferably on the armature above mentioned. Part of said disc servs as insulator and part as conductor; the conducting portion is provided with a local wire. The motan of the disc is adjustable. The said disc bears against a metal surface also provided with a local wire. Various arrangements equivalent to the said disc may be used.

Third. In the use of compensating springs in combination with our movable contact, acting one against the other, and so adjusted as to maintain the armature of a relay or its equivalent in any required position. The springs and magnet act on the armature so as to compensate each others action; one spring only may be used.

Fourth. In connecting two circuits outside the relay or pecker, and connecting the armature of the relay or pecker to the line. The forward stop of the relay or pecker is connected through the right hand electro-magnet and the back stop through the left hand electro-magnet, or vice-versa, to the opposite poles of the battery, the centre of the said battery being carried to earth.

Fifth. In connecting the receiving relay or pecker through its armature or equivalent to a receiving battery. The centre of such battery is connected to earth, and the extreme positive pole to the right hand stop of relay or pecker, and the extreme negative pole to the left hand stop, or vice-versa.

Sixth. In winding the relays differentially.

Seventh. In using two arms pivoted one on each side of an armature or its equivalent, of a relay or pecker or the equivalent of a relay or pecker, the said arms being placed angularly in relation to the armature but in the same plane. The free ends of the said arms are connected together by a bar which passes freely through a hole or slot in the armature. The ends of the said bar serve as contact points, and a parallel bar passes through the armature and has the ends touching the arms above described. Stops are provided and compensating springs are attached to the armature.

A.D. 1875, February 12.—No. 526.

BOGGETT, William, of Lindsey Houses, Chelsea, in the county of Middlesex.—"Improvements in "the production of ornamental designs and in ornamenting surfaces."

In carrying out these improvements sheets of tin foil paper or paper coloured, embossed, or metalized, dyed cloth similarly prepared, or sheet gelatine are used, which materials are perforated in a variety of ways and into different shapes, more especially to form with them a number of parellel strips or bars, which when placed over each other at different angles produce by their different colours and transposition an endless number of patterns or designs, enhanced in some cases by tinsel. The patterns, borders, or other designs thus produced may be employed in the making of blocks or types for printing in colours, for paper staining, and various other purposes, and are applicable to various descriptions of manufactured articles, and may be applied in each case in the manner employed for other designs.

A.D. 1875, February 12.—No. 527.

ATKINS, Thomas, of Tippendell Lodge, Saint Albans, in the county of Herts, civil engineer.—"Improvements in apparatus for ventilating railway and other carriages, ships, buildings, warehouses, "and drains or sewers."

This invention relates to improvements in the arrangement and construction of apparatus for ventilating railway and other carriages, ships, buildings, warehouses, and drains or sewers.

For this purpose cones or conical air passages are employed, either of metal or other material.

The mouth or entrance to the cones or passages should offer about three times the surface of the centre, and the cross passage for effecting ventilation should be one sixth of the surface of the mouth or entrance to the cones or air passages.

By the arrangement and construction of this apparatus a cross current of air is produced.

A tongue or valve is placed or arranged near the centre of the cone, which valve may be suspended from two centres. The air is forced through the cross aperture into the apartment or place to be ventilated.

A moveable valve is fixed in the cross piece for regulating and adjusting the exact quantity of air required in the apartment or place to be ventilated.

Chimney cowls are arranged with a moveable cone and valve, which is always presented to the wind, thus producing a constant vacuum in the chimney.

The current of air entering a ship or other place to be ventilated may be caused to pass through coarse canvass, felt, cotton, or other evaporative materials, kept damp for the purpose, by which means any required degree of temperature may be secured, or the air may be caused to pass through compounded carbon, composed of mineral, animal, and vegetable charcoal.

A.D. 1875, February 12.—No. 528.

WEILL, Louis, and **HARBURG**, Henry, both of Hatton Garden, in the county of Middlesex, manufacturers and importers.—(*A communication from Louis Auguste Grosclaude, of Geneva, in Switzerland.*)—" Improvements in musical boxes and other similar instruments."

A catch lever shifts the barrel to a position corresponding with any one tune of a series of tunes.

A stud carrying a numbered strip and a roller carrying a strip marked with the names of the tunes are actuated by the same motion correspondingly.

A.D. 1875, February 13.—No. 529.

VICARS, Thomas, the elder, and **VICARS**, Thomas, the younger, both of Liverpool, in the county of Lancaster, engineers, and **SMITH**, James, of the same place, baker.—" Improvements in self-stoking " furnaces and in steam generators."

This invention relates—

First. To improvements in our well known self stoking furnaces, and consists in removing partly or entirely the furnace bridge. We sometimes employ an auxiliary grate to catch falling clinker and fuel.

Secondly. To improvements in the system of steam generators for which we obtained Her Majesty's Letters Patent of the year 1874, under the serial numbers 699 and 1773, and consists in the use of a corrugated water box or boxes as sides and roof of furnace or part thereof.

Third. To the application of the improvements second above described in combination with diaphragms or partitions to Lancashire or Cornish boilers.

A.D. 1875, February 13.—No. 530.

HALL, William Joseph, **MARSHALL**, Frank Alexander, and **SKINNER**, Charles Weeding, all of Newcastle on Tyne in the county of Northumberland.—" Improvements in feed-heaters for boilers."

According to this invention the feed heater is made as a hollow shell or saddle-shaped vessel enclosing the boiler wholly or partially within it, leaving between the periphery of the boiler and the inner wall of the shell a narrow space through which the products of combustion are conducted on their way from the boiler tubes or flues to the chimney.

A.D. 1875, February 13.—No. 531.

KIDD, Joshua, of 12, Dartmouth Street, in the city of Westminster, engineer.—" Improvements in the " manufacture or production of gas for heating or other purposes and in the materials and apparatus " or means employed therein."

This invention consists essentially in the generation of a mixture of carbonic oxide, hydrogen, and carburetted hydrogen gases from peat or wood charcoal or mixtures of the same, or from high dried or charred peat either alone or mixed with other solid fuel, contained in a closed chamber and kept in a state of incandesence below by a jet of air and steam, the external atmosphere being entirely excluded. The mixture of gases thus generated is conveyed away by a pipe from the upper part of the closed chamber to a gas holder wherein it is stored for future use, or it may be conveyed directly by the pipe to the place where it is to be burned.

A.D. 1875, February 13.—No. 532.

DONALD, James, of the firm of George Miller and Company, of Glasgow, in the county of Lanark, North Britain, manufacturing chemists.—" Improvements in mechanical stoking apparatus for steam- " boiler and other furnaces."

The bottom of a hopper is fitted, with a sliding door which when open allows the fuel to fall on a plate. The fuel is at intervals pushed forward into the furnace by a pusher moved by the piston rod of a long hydraulic cylinder. The hydraulic cylinder is fitted with a four-way cock which is reversed by a tumbling lever actuated by water. The length of interval between each action of the apparatus depends on the rate at which the water is allowed to flow into the box of the tumbling lever, and can be easily regulated by a stop cock on the supply pipe. The improved bars consist of main parts disposed transversely in the furnace so that they can rock. Each bar is formed with short pieces projecting from its sides, and such projecting parts of one bar enter in between the similarly projecting parts of the adjacent bars. The locking may be effected at intervals by hand or by means of hydraulic apparatus.

A.D. 1875, February 13.—No. 533.

PERKINS, William, of Arlington Lodge, Herne Hill Road, Brixton, in the county of Surrey, engineer.—"Improved means of and appliances for effecting communication between passengers and "guards of railway trains."

According to this invention communication is effected between guards and passengers, or between drivers and guards by the employment of fog signals or other similar detonating articles put into position for exploding by suitable mechanical appliances.

A.D. 1875, February 13.—No. 534.

DOLNE, Lambert, of No. 10, Rue Janfosse, in the city of Liége, in the Kingdom of Belgium, armourer.—"Improvements in revolvers."

The invention consists in means of avoiding the "stocking" or recessing of the side pieces or cheeks into the stock frame for forming the handles of pistols, by making the sides of such side pieces or cheeks next the stock frame flat and fixing them thereto by means of a bolt or screw passing through such side pieces or cheeks and through a lug or projection formed on or fixed to the stock frame.

A.D. 1875, February 13.—No. 535.

PIEPER, Carl, of Dresden, Saxony.—(*A communication from Emil Kaselowsky, of Berlin, Prussia.*)—"Improvements in steam boilers."

This invention relates to the construction of steam boilers with an internal fire-box, and the object of the same is to avoid all stay-bolts, so as to facilitate the cleaning of the boiler from scale and sediment, to make the same safer against accident and to afford other advantages.

A.D. 1875, February 13.—No. 536.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Adolph Lazar, of Vienna, engineer of the Imperial Royal Austrian General Office for the Inspection of Railways.*)—"Improvements in the permanent way of "railways."

These improvements consist essentially in the application of iron transverse sleepers of a peculiar construction.

A.D. 1875, February 13.—No. 537.

STUART, Charles, of Halifax, in the county of York.—"Improvements in safety valves for boilers, "and in the means or apparatus for detecting the height of the water in the same."

A circular valve when closed in contact with circular inverted fixed or adjustable valve or disc is used with hollow box over valve, having pipe leading to boiler, so that water getting below tube runs into boiler from box and steam escapes.

Second. There is a hollow radial arm at end of chamber; a pipe in box extending within boiler allows water to pass to radial arm and chamber, and causes a pointer to indicate position of water; other means may be adopted for operating radial arm.

A.D. 1875, February 13.—No. 538.

BROWN, Nicol, of the city of Glasgow, in the county of Lanark, North Britain.—"Improvements in "weighing machines."

This invention consists in an arrangement of mechanism to be applied to platform weighing machines to make them automatically and speedily print in figures the actual weight of railway wagons and their contents, or other loads placed on them (by the mere action of a single hand lever) on endless bands of pater, which are fed with colour or transferring paper between them, over guiding rollers in front of a column or range of type or engraved figures on one side of the upper end of a reciprocating rod. This rod is hung by a chain over the larger of two reducing pulleys revolving together on the same fixed centre, below the free end of the main lever or steelyard of the machine, to which the free end of another chain, wound in the reverse direction round the smaller chain pulley, is attached. These differential pulleys and chains raise the types to their respective heights proportional to the rise of the lever of the weighing machine, and weights corresponding thereto, and opposite to a spring stamper actuated through a link lever, and releasing catch, connected to the hand lever. The point of the stamper, which is reduced to the depth of each row of type, by the power of its spring when let go forces the paper against the type, thus giving the impression on the white paper from the coloured paper; after which the back action of the hand lever turns the feeding rollers by a ratchet and pall, and brings a fresh surface of the paper into position for the next forward action of the hand lever to give the next impression or record of the weight, caused by the action of the lever of the weighing machine and hanging rod with the type, all as before stated in reference to the first action. To give the balancing increasing weight action on the lever of the weighing machine a small weight is hung by a light chain over a curved or cam surface on the axis of the reducing wheels, or it might be on a different axis and curved lever and connected to the rod with the type, so as to give the differential weight action required.

A.D. 1875, February 13.—No. 539.

BAILEY, William Henry, of the Albion Works, Salford, in the county of Lancaster.—"Improvements in steam boiler fittings partly applicable to other purposes."

This invention relates to the construction of a combined apparatus to be affixed to the front of a steam boiler, and which shall serve the purpose of a pressure gauge water regulator, compound lock-up safety valve, water gauge, test cock, and indicator for regulating the supply of oxygen to the furnace, the improvements being equally applicable to some of the parts of the apparatus used separately for their several special functions, and also as a steam trap for removing the water of condensation from vessels containing steam. A revolving motion obtained by the feed water passing through the apparatus is utilized for working the scrapers upon Twibill's or other similar construction of fuel economiser, for visibly indicating that the injector is really at work, or for working the self acting stokers, which supply dust coal to furnaces of steam boilers, a modification being also useful for preventing incrustations in the tubes of fuel economisers.

A.D. 1875, February 13.—No. 540.

EDWARDS, William, of 122, Rock Street, Sheffield in the county of York.—"Improvements in the manufacture of railway and other wheels."

My invention has for its object the manufacture of solid disc railway and other wheels from ingots of cast steel, and consists in forging the said ingots into round blooms varying in size according to the diameter of the wheel required, and a hole being punched in the centre of the blooms the same are then forged or pressed in a succession of dies of different shapes until a perfect and complete wheel is produced without the aid of any rolls or rollers.

A.D. 1875, February 13.—No. 541.

WALKINGTON, William, of Leeds, in the county of York, engineer.—"Improvements in the construction of wheel or roller skates."

The said invention consists in fitting and arranging the wheels or rollers upon the stock or body of the skate in combination with devices which allow the skate to be turned with very slight exertion on the part of the wearer.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 7 to August 13, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, February 15.—No. 546.

SHAW, Edward, of the city of Manchester, in the county of Lancaster, perambulator manufacturer.—" Improvements in wheels for perambulators, velocipedes, and all descriptions of carriages or " vehicles."

The felloe of each wheel is made of T or ⊔ shaped iron and drilled or bored at suitable distances apart perforations into which is fastened by rivetting or other well known means; one end of a number of metal rods or spokes, and one end of half the number are fixed to a central disc and hub, and the other half to another central disc and hub, the two discs and hubs being used instead of the ordinary nave or hub made in one piece.

The two discs and hubs are separated from each other according to the size of the wheel, and in the space between the two a screw and nut is placed, each having a hole for the axle to pass through, so that by turning the nut or screw in the proper direction the two discs and hubs can be widened from each other and thereby give the rods or spokes any required amount of rigidity or tension, there being lock nuts or keys when necessary to keep the parts firmly in their places; and when desired a tubular block and wedge is used instead of the screw and nut.

A.D. 1875, February 15.—No. 549.

BROWN, John, of the city of Glasgow, in the county of Lanark, North Britain, engineer.—" Improvements in machinery or apparatus for the manufacture of confectionery."

This invention consists of an improved construction of an angled revolving pan for making the rolled or rounded sugar-coated confections; and of its motive high-pressure oscillating steam engine combined, all portable or carried on one frame, the exhaust steam of the engine being blown into the casing of the pan to heat it, and the confections being heated therein. And further, in an improved construction and arrangement of steam boiler for generating the steam to drive the engine of this and other such confectionary pans, consisting of a flat round-ended boiler, with the usual sugar boiling fires within it, which heat this boiler, and a horizontal tubular boiler placed with its end abutting against the side of the former, so that the flames thereof pass through the tubes of the latter, and the upper and lower water spaces of both boilers are connected to give perfect circulation.

A.D. 1875, February 15.—No. 551.

WOODWARD, Henry Franklin, of the city and State of New York, United States of America.— —" Improvements in overalls for workmen and others."

This invention relates to overalls made with jackets and trousers in one, the garment extending from the ankles to the shoulders, open down the front, and provided with jackets and a waist belt. It is generally preferable to cut the cloth, so that it passes over the shoulder without seam and is united behind at the waist.

These overalls retain the under garments and do not open at the waist by the movements of the body.

A.D. 1875, February 15.—No. 552.

EVANS, ISAAC, of Birmingham, in the county of Warwick, manufacturer.—" Improvements in the " construction and manufacture of handles for rug, shawl, parcel, and other straps, bags, portmanteaus, and for other like articles."

This invention consists in making the grip of the said handles and the eyes or loops at the ends thereof through which the straps are passed from sheet metal. The grip part and loop parts are either made from one piece of sheet metal, preferably sheet iron, or are made separate. When the loops are made separate they are either rigidly connected to the grip part or are jointed thereto. The grip part has either a cylindrical or trough form. The metallic handles so made are finished by painting or japanning, or are covered with leather. Swivelling T pieces are attached to the loop parts of the handle to facilitate the fastening and unfastening of the shoulder strap, sometimes used for carrying a rug or shawl about the person.

A.D. 1875, February 16.—No. 556.

PARKER, GEORGE, of Denaby, in the county of York.—" An improved machine or apparatus for " 'riddling' and loading coal or other minerals."

This invention has for its objects the lessening of the manual labor required to load coal and the effecting of the screening thereof at the time of loading.

The machine or apparatus is constructed with octagonal shaped wheels on shafts, to which motion is imparted by suitable gearing.

Round these wheels are passed endless chains across which are fastened projecting bars perforated with openings.

This arrangement is carried by a suitable framing fitted with wheels.

The coal is placed by manual labor only on to the lowermost of the bars, to which the operation of the octagonal shaped wheels gives a forward and jerking motion, which riddles the small from the serviceably sized coal through the perforations of the bars, and carries the useful coal up to the top level of the corf or other receptacle into which it falls.

A.D. 1875, February 16.—No. 560.

OLPHERTS, RICHARD, of Ardee, in the county of Louth, Ireland.—" Improvements in apparatus for " exerting pressure or power by means of screws, specially applicable to screw presses."

This Provisional Specification describes the employment of anti-friction rollers to diminish friction in screw presses and in other apparatus for exerting pressure or power by means of screws.

A.D. 1875, February 18.—No. 594.

ATKINS, JAMES, and TORR, CHARLES WALKER, of the firm of Robert Walter Winfield and Company, of Birmingham, in the county of Warwick, merchants and manufacturers.—" Improvements in the " construction and ornamentation of gasaliers, chandeliers, candelabra, and other lamps, and in gas " brackets."

According to this invention the pulley frame and pulleys of sliding gaseliers and chandeliers are fixed above the ceiling-plate or ceiling-rose for the purpose of concealing the said parts, and the balance weights are made in sections arranged around a central tube so as to form one design or ornament, or the balance weights in descending are made to enter a vase or hollow receptacle. Or the balance weight is expanded at its lower part, and the under surface is made into a reflector or perdifume. Balance weights are cast in lead, iron, or zinc, and ornaments of brass attached thereto. By means of an arrangement of parallel motion the arms of the gasalier, chandelier, or table lamp may be raised and lowered without raising and lowering the body of the lamp. In fixing chandeliers and other like lamps a valve is attached to the ceiling plate, which is so acted upon by the down pipe of the lamp that in screwing the said pipe to the ceiling-plate the junction is made gas-tight before the end of the down-pipe acts upon the valve and admits gas through the pipe. The pattrasses of gas-brackets are made partly of metal and partly of wood.

A.D. 1875, February 19.—No. 614.

LOEBL, Samuel, of the firm of J. Loebl and Company, of Aldermanbury, in the city of London, manufacturer.—"Improvements in apparatus for heating and cooking purposes."

A gas pipe communicates with a stove, the flow of gas being intercepted by a cock or valve worked by a moveable gas pipe forming a tubular lever or arm, and which when pressed on by the tool or article to be heated brings its flame to the stove and ignites the gas which it allows to flow thereto from the first named pipe.

A.D. 1875, February 20.—No. 627.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, civil engineer. —"Improvements in the means and apparatus for manufacturing alkali, which improvements are "partly applicable to other purposes,"

The features of novelty are:—

Firstly.—The reduction of sulphate of sodium or barium to sulphide of these metals, by subjecting either of the sulphates to the flame of a blast furnace, described in the Specification of my Letters Patent, numbered 2984, and entitled, "Improvements in the manufacture of iron and steel," the sulphate employed being incorporated in a powdered state with carbonaceous matter and clay, and worked into lumps in the same manner and for the purpose of being subjected to the same furnace treatment as is directed to be applied to powdered iron ore in the aforesaid patent.

Secondly.—The addition of ferric oxide to either of the aforesaid mixtures of sulphate of barium or sodium, in order to produce by the same furnace treatment, the oxides of barium or sodium, according to the metallic salt employed.

Thirdly.—The removal of the sulphur from the sulphides produced as above, by ignition or boiling in water with the powdered oxide of any metal having a stronger affinity than sodium or barium for sulphur.

Fourthly.—The addition of reduced metallic iron or copper to the mixture referred to in the above first clause, to aid in the reduction of the sulphates to oxides of barium or sodium.

Fifthly.—The incorporation, consolidation into lumps, and furnace treatment, all as described above, of a mixture of ferric or cupric sulphide, sodic chloride, and carbonaceous matter, with an oxidating blast in the furnace mixed with steam as the means of recovering the sulphur taken up by the iron or copper in the above process, by forming sulphate of sodium.

A.D. 1875, February 20.—No. 635.

TILLEY, William, of Stafford, photographer.—"Improvements in photographic processes, and in "apparatus to be used in connection with the said improvements."

This invention consists in producing combination photographs and photographic enlargements in the following manner:—

In producing a combination photograph, that is, a portrait or object in combination with any required background, a portrait of the sitter is taken, having a dark background. The sitter is then masked by means of curtains and a white background placed behind him. A positive background is next placed near to the sensitive plate. The light from the white background is thrown upon the positive background and passes through it on to the sensitive surface. A negative impression of the background is thus produced around the image of the sitter. The background photograph is carried in a frame jointed to the dark slide or to the camera. By means of the said frame the background photograph may either be placed parallel with the sensitive plate or turned from the said plate.

For enlargements and for combination printing without enlargements a separate mask and negative are used. The portrait with a white background is taken on one plate and a mask on another plate. A reverse mask is taken from this mask, the said reverse mask having a transparent background, and the portrait and mask are fixed to the parts or sides of a double or hinged dark slide. The mask is carried by an adjustable carrier.

The dark slide having been fixed in front of the enlarging lens, the side of the slide containing the mask is turned down while that carrying the portrait negative is copied on an enlarged scale on the sensitive surface. The other part of the slide carrying the mask being raised, and that carrying the portrait being depressed, a photographic background is placed nearly in contact with the sensitive surface, and the mask being illuminated the light passes through the superposed background, and the latter is printed, the mask preventing any printing upon the portrait already impressed on the plate. The portrait and mask may be used for combination printing without enlargements.

A.D. 1875, February 23.—No. 666.

ATKINS, James, of the firm of Robert Walter Winfield and Company, of Birmingham, in the county of Warwick, merchants and manufacturers.—" Improvements in the construction and ornamentation " of metallic bedsteads and cots."

This invention consists in constructing and ornamenting the head and foot ends of bedsteads and cots and parts connected with the said ends in the following manner :—The head or foot end is made of a foundation of wood, covered or partially covered with fabric or non metallic material, and inserted in or fixed to a metallic frame. This covered foundation is ornamented by the fixing thereon of mouldings, designs, or devices made preferably of metal. The ornamented end, fixed in a metallic frame, is connected to the bedstead frame by lugs on the corner blocks. The vertical sides of the metallic frame carrying the ornamented end replace the ordinary pillars in half tester and French bedsteads, and also in cots. For four post bedsteads the head and foot ends are used with the ordinary corner blocks and pillars.

A.D. 1875, March 22.—No. 1042.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Elbert B. Porter, of Havana, in the Island of Cuba.*)—" An improved screw propeller."

The invention consists of a screw propeller with semi-elliptic or otherwise bent and twisted blades attached at one or both ends to shaft, and provided with interior and exterior auxiliary wings of sufficient size and twist.

A.D. 1875, March 30.—No. 1139.

BENSON, Martin, of No. 9, Southampton Buildings, London.—(*A communication from Joseph Frank Wicks, of the city and county of Providence, in the state of Rhode Island, United States of North America.*) " Improvements in looms."

My improvement consists in connecting the main shaft of the loom with a rotating shaft or sleeve, which operates the " harness lifters," " depressers," and " evener bars," by means of a clutch controlled by shipping mechanism, whereby I am enabled to disconnect said harness actuating mechanism at will, and independent of other parts of the loom.

A.D. 1875, August 12.—No. 2843.

ANDERSON, George, of 4, Cannon Row, in the city of Westminster.—" Improvements in apparatus " for the more economical manufacture and supply of illuminating gas."

The improvements consist, firstly, in the building of retort houses in such a manner that they will occupy a smaller space, and therefore cost less in construction, while they permit more work being done within them, and afford increased facilities for ventilation. This is done by increasing the width and reducing the length of the retort house, and by setting the retorts in rows parallel to each other, instead of in one continuous line, as is now usually done. The roof instead of being made in one span is constructed with a number of ridges and supported by columns. By these means the amount of brickwork and the weight of the roof may be considerably reduced, while the space enclosed may be more advantageously employed than usual.

Secondly, in the construction of the condensers, which may be either of pipes set vertically or horizontally, but preferably the latter, and providing them with valves so arranged that one, two, three, or more portions of the apparatus may be employed at one time, so as to allow of the gas being retained in the condenser and exposed to an increased or decreased surface, in proportion to the temperature of the atmosphere. This part of the apparatus too from its arrangement may be also constructed with great economy.

Thirdly, in the construction of washers, each of which is made with a high rectangular iron case in which two, three, or more semi-circular partitions are fixed. Through the centre of each semi-circle is fitted a shaft which carries arms for the support of a drum with a circular brush-like appendage made of split whalebone or other like material, and so fitting the interior of the semi-cylinder as to offer little or no impediment to its free revolution. Water or other liquid is admitted from above and descends into the top compartment to such a height as will cover the lower part of the circular brush, the excess of liquid passing to the next lower compartment, and so on throughout the series, the height of liquid in each vessel being regulated by the position of the pipe communicating with the adjoining chamber. The gas is admitted at the bottom and passes through a short horizontal washer or chamber into the lower compartment, when upon motion being imparted to the shaft the gas is broken up into innumerable streams, washed by contact with the wet brush, and swept on to the outlet, from whence it flows to the inlet of the next upper chamber, there to be operated upon in the like manner, and so on till it reaches the top outlet. This is an arrangement which absorbs but little power to drive it, and consequently it can be put in operation at but small cost.

Fourthly, in the construction of wet purifiers. This is done by forming a shallow circular covered vessel, and admitting gas to it near the bottom, where it passes by numerous holes round the interior circumference through liquid to the centre of the purifier. Here the gas rises, passes through another plate and further liquid, this process being continued till it reaches the outlet at the top, from whence it passes to the dry purifiers.

Fifthly, in the construction of dry purifiers which are quadrangular in front elevation, but in transverse vertical section are of a rhomboidal form. The vessel or chamber is divided into a number of compartments, each fitted with many trays or grids to receive the purifying material, and lying at such an inclination as to permit of the material being raked out through doors provided for the purpose in front of the purifiers, whenever it becomes necessary to discharge the vessel. Doors on the opposite side are also furnished, through which the vessel may be charged with fresh material. Connections and valves are also provided by which the gas may be sent through one, two, three, or more of the divisions or compartments according to the condition of the material therein.

There is another form of dry purifier which I prefer to make of either iron, brick, or stone, and either built upon, or partly above and partly below the surface of the ground. They are made by preference circular, although they may be polygonal or any convenient shape. They are built, however, of a greatly increased depth, so as to admit of a far larger number of grids, and contain a great deal more purifying material than purifiers of the same area ordinarily do. Provision is made by one arrangement for the admission of the gas at one or more of three points according to the condition of the material therein, and a suitable outlet is also provided for the gas. In another arrangement the pipes are so ordered that the gas may be admitted both at the top and bottom of the vessel, at the same time the gas passing off at an outlet placed in the middle of the side of the vessel. The removable cover instead of occupying the whole area of the purifier, is reduced to such size only as will allow of the vessel being discharged with facility, and,

Sixthly. In the construction of purifier houses suitable for the enclosure of the dry purifiers described in the previous paragraph. They may be built of brick, masonry, concrete, or any suitable material, of a shape preferably the same as the purifier but of much larger area. The building has a roof which is furnished with both dormer windows and one or more ventilators. The sides of the building also have openings which may be fitted with storm windows, so as to be closed or open as occasion may require. There are also stages or galleries erected round the outside of the house from which access may be obtained to the interior. Between the purifier and the inside of the building and at convenient heights are fixed several series of radial girders, set at an inclination either to or from the purifier. The spaces between the girders are filled in with arches so as to form a series of inclined floors, upon which the purifying material (supposing it to be oxide of iron) may be placed for revivification, spaces being left whereby the material may be conveyed from one floor to another, or to the bottom when necessary. At the top of the purifier, and between it and the surrounding walls, is placed a short railway which is free to revolve round the purifier, and upon the railway is a small suitably shaped waggon made to tip, or otherwise be discharged, so that when the purifier is to be emptied the material is hoisted, put in the waggon, run along the railway, and then shot out on to any of the floors selected; or the waggon itself may be so contrived as to be adapted for being lowered into the purifier and to be subsequently hoisted and used as before described. As the material becomes renovated, it is raked either into the purifier through openings made for the purpose, or is allowed to fall to the bottom outside the purifier, and when sufficient is collected the purifier may be recharged by lowering the waggon, filling, hoisting, running it along the railway, and emptying it into the vessel upon the grids, where it may be spread in layers of the requisite thickness.

By the adoption of these various means, space and the expenditure of material may be greatly diminished, thereby decreasing the capital to be employed, while from the arrangement of the different parts, manual labour is so considerably reduced that gas produced through the agency of these improvements may be supplied far more economically than has hitherto been generally the practice.

Bishop, G. (*Knip*), 403, Feb. 3, Exhibiting pictures.
Blain, J., 278, Jan. 25, Fire extinguisher.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Blake, L. R., & Gardner, C. F., 206, Jan. 19, Boots [and shoes.
Blakeborough, R., & Beck, J., 227, Jan. 21, Hydrants [and fire-cocks
Blot, A. (Vaughan), 37, Jan. 4, Presses.
Bluck, E., 72, Jan. 8, Railway carriages.
Boblique, L., Leplay, H., Box, J., & Aubertin, E., 181, [Jan. 16, Phosphates and phosphorus.
—— L., Leplay, H., Box, J., & Aubertin, E., 214, [Jan. 20, Disinfecting sewage, &c.
Boggett, W., 526, Feb. 12, Ornamental designs, &c.
Bogle, A. (Lake), 395, Feb. 3, Brushing boots and shoes; [polishing, &c.
Bohlken, A. (Jensen), 295, Jan. 26, Washing machine.
—— *A.* (Jensen), 307, Jan. 27, Earth-boring augers.
Bois, A., 45, Jan. 5, Safety guard for tram-cars, &c.
Bonnefond, A., 46, Jan. 5, Water meters.
Bonner, J., 11, Jan. 1, Weaving.
Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
—— H.A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
—— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
—— H. A. (*Richards*), 2649, July 26 (*App.* 5.) [Type-setting machines.
Bontemps, P. (Clark), 99, Jan. 11, Hydrostatic motor.
Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.) [Sewing machines.
Borchart, H. (Newton), 385, Feb. 2, Bullet patching [machinery.
Boucley, P., 451, Feb. 6, Straps, bands, &c.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27, Railway signalling.
—— M. P. W., 96, Jan. 11, Hot gas & steam engines.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
—— G. T. (*Société Anonyme du Cuivre Français*), [2042, June 3 (*App.* 49.) Protosulphuret of [iron and sulphuretted hydrogen gas.
—— G.T. (*Société Anonyme du Cuivre Français*), [2084, June 5 (*App.* 50.) Kilns or ovens.
—— G. T. (*Kohrig & Pzillas*), 2486, July 10 [(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, har- [ness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181, [Jan. 16, Phosphates and phosphorus.
—— J., Aubertin, E., Boblique, L., & Leplay, H., 214, [Jan. 20, Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish- [ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9, [Filling and corking bottles.
Bradley, C., & Campbell, J., 480, Feb. 9, Combing fibres.
—— G., & Madderson, T., 63, Jan. 7, Crushing [stones, &c.
—— J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining [powder.
Briebach, J. A., 313, Jan. 27, Indicating position of [rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
—— J., F. W. & W. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
Brierley, W. W., J. & F. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal [apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Broadfoot, J., 507, Feb. 11, Waterclosets.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P., [76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking [apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, H., 475, Feb. 9, Inkstands.
—— H., 476. Feb. 9, Call or signal bell apparatus.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing [electro-type shells.
Brown, J., 549, Feb. 15 (*App.* 7.) Confectionery.
—— J., 714, Feb. 26 (*App.* 6.) Copper plates for [printing, &c.
—— J. F., & Baird, J., 258, Jan. 23, Weaving.
—— J. W., & Allan, G., 525, Feb. 12, Electric telegraphs.
—— M. H., 352, Jan. 30, Fire guards.
—— N., 538, Feb. 13, Weighing-machines.
—— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and [windows.
—— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
—— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
—— W. Morgan- (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of type.
—— W. Morgan- (*Johnson & Harding*), 2250, June 19 [(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12, [Converting iron scraps, &c. into steel.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29, [Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.) [Vapor and gas-engines.
Brunner, W. G. (*Schnabel & Henning*), 505, Feb. 11, [Portable cranes.
Buckley, J. B., & Stock, E., 378, Feb. 2, Stench traps.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Bürgin, E. (Jensen), 506, Feb. 11, Increasing the adhe- [sion of locomotive wheels on rails.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway car- [riages; tyres.
Bury, S., 465, Feb. 8, Self-acting temples.
Bustin, R. (Lake), 185, Jan. 18, Hanging wall papers.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18, Casks.
—— T., & Thornley, G., 1518, Apr. 26 (*App.* 44.) [Jointing cask staves.

C.

Cadogan, Hon. G., 328, Jan. 28, Apparatus for igniting [and holding matches.
Calley, S., & Share, H. H., 377, Feb. 2, Raising, &c. boats.
Cameron, A. S., 429, Feb. 4, Steam-engines.
Campbell, J., & Bradley, C., 480, Feb. 9, Combing fibres.

Cannon, W. G., 294, Jan. 26, Cup and ball joint for gas [pendants, &c.
Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casson, T., 123, Jan. 13, Hydraulic engines.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
Cave, J. O'C., 140, Jan. 14, Aërial navigation.
—— J. O'C., 141, Jan. 14, Governor, steam gauge, [safety valve, &c.
—— J. O'C., 571, Feb. 17 (*App.* 34.) Rest for knives, [forks and spoons.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chameroy, E. A., 417, Feb. 4, Cocks for water, steam, &c.
—— E.A., 828, Mar. 6 (*App.* 6.) Weighing machines.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H. (Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing [machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket [eyes on tools.
Chaquette, E., 416, Feb. 4, Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas, parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from [fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Chivers, A. & S., 349, Jan. 29, Concentrating sulphuric [acid.
—— S. & A., 349, Jan. 29, Concentrating sulphuric [acid.
Clark, A. M. (*Portait & Weber*), 28, Jan. 2, Preparing [fibres for spinning.
—— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of [light and heat.
—— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
—— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting [hats, &c.
—— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial [apparatus.
—— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for [nut blanks.
—— A. M. (*Eyquem*), 256, Jan. 22, Steel.
—— A. M. (*Rogé, Poret, Baffoy, & Dupré*), 288, [Jan. 25, Preserving woven fabrics.
—— A. M. (*Robinson*), 338, Jan. 28, Feeding and [burning oils in furnaces.
—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.
—— A. M. (*Porter*), 1042, Mar. 22 (*App.* 7.) Screw [propellers.
—— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery [and handles.
—— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking [screw nuts.
—— A.M. (*Rochow & Matthiessen*), 1810, May 14 (*App.* [46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway [for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro- [magnetic engines.
—— A.M. (*Lodge*), 2520, July 13 (*App.* 3.), Fulling mills.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— J. L., & Standfield, J., 514, Feb. 11, Floating docks [and pontoons.
—— W., 80, Jan. 9, Railway breaks.
—— W. (*Malo*), 404, Feb. 3, Ships or vessels.
—— W. (*Legat*), 463, Feb. 6, Sewing straw hats, &c.
—— W. (*Lontin*), 473, Feb. 8, Application of electro- [dynamic machines.
—— W. (*Rousseau*), 2657, July 27 (*App.* 5.) Railway [signalling.
Clark, W. (*Rousseau*), 2740, Aug. 4 (*App.* 6.) Railway [Signalling.
Clarke, T. A. W., Corah, E., & Cooper, J. H., 470, Feb. 8, [Knitting machines.
Clayton, J., Whittaker, T., & Duxbury, J., 73, Jan. 8, [Bricks, tiles, &c.
Clements, J. M., 367, Feb. 1, Sewing-machines.
Cleveland Paper Box Machine Co. (Haseltine), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
Clinker, C., 513, Feb. 11, Printing machines.
Clough, W. R. (Haseltine), 1640, May 3 (*App.* 45.) Cork- [screws.
Coales, S. L., 334, Jan. 28, Coiling and uncoiling hose [pipes.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and [windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
—— S., 495, Feb. 10, Compositions for inkstands, picture- [frames, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers [and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Connell, A., 302, Jan. 26, Wagons.
Coombe, J. C., 287, Jan. 25, Blacking.
Cooper, J. H., Clarke, T. A. W., & Corah, E., 470, Feb. 8, [Knitting machines.
Constant, J. (Johnson), 301, Jan. 26, Connecting tubes [to tube plates.
Corah, E., Cooper, J. H., & Clarke, T. A. W., 470, Feb. 8, [Knitting machines.
Cordillot, H. F. A., & Mather, W., 479, Feb. 9, Steaming [printed fabrics.
Cornely, E. (Gedge), 306, Jan. 27, Edging machines.
Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cottrill, S., 414, Feb. 4, Railway signals.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, W., & Howard, J., 277, Jan. 25, Saddle girth [tightener.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
—— A. H., 374, Feb. 1, Marking and cutting textile [materials.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy- [menageries.
Crawley, W., 517, Feb. 12, Ships.
Crocker, S.L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.
Cromby, E. E., 425, Feb. 4, Dry gas meters.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
—— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Cuivre Français, Société Anonyme du (Bousfield), 2042, [June 30 (*App.* 49.) Protosulphuret of iron [and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.* 50.) Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary [vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti- [lating water-closets, &c.
Dauner, J. L. (Dufrené), 438, Feb. 5, Horse collars.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Daw, M. W., 496, Feb. 10, Scissors.

Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
Deacon, H., 332, Jan. 28, Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or [aërial apparatus.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving [life at sea.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c. [machines.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.) [Sewing machines.
Devenport, C., 483, Feb. 9, Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308, [Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308, [Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and [stuffing box.
Dignum, F. B., 515, Feb. 12, Breakers or water casks [for boats.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Dolne, L., 534, Feb. 13, Revolvers.
Dominy, G., & Russell, J., 398, Feb. 3, Guards for [carving forks.
Donald, J., 532, Feb. 13, Stoking apparatus for furnaces.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
—— H. A. (*Dauner*), 438, Feb. 5, Horse collars.
Dumont, A., & Alfieri, E., 512, Feb. 11, Lockets.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H. [(Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8, [Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edison, T. A., 384, Feb. 2, Telegraphs.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677, [May 5 (*App.* 45.) Paddle wheels.
Edwards, Edmund (*Boullenot*), 75, Jan. 8, Safety lamps.
—— Edmund (*Edwards*), 357, Jan. 30, Rollers for [fabrics.
Edwards, Ernest (Edwards), 357, Jan. 30, Rollers for [fabrics.
Edwards, W., 540, Feb. 13, Railway and other wheels.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Elce, J., 366, Feb. 4, Spinning and doubling.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Espir, C. (*Le Bricquir*), 291, Jan. 26, Mining powder.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or [aërial apparatus.
Evans, I., 552, Feb. 15 (*App.* 7.) Handles for parcel and [other straps, &c.
—— P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farris, W. H. (Lake), 310, Jan. 27, Water circulating bars.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c. fibres.
—— W. & J., & Newsome, C. H., 14, Jan. 1, Card- [ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9, [Filling and corking bottles.
Fewster, W., 293, Jan. 26, Saving life and property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Financière de Paris (la Société) (Johnson), 704, Feb. 25 [(*App.* 6.) Treating alunite.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air [engines, &c.
Fitz, E. E., 187, Jan. 18, Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flachfeld, J. (*Hollerbusch*) 440, Feb. 5, Pencils.
Flagler, H. K. (Hunt), 290, Jan. 26, Welding tubes, &c.
Flitcroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing- [machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Con- [verting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
Fouillon, J. (Maes), 331, Jan. 28, Gloves.
Foundries & Forges Co. (Browne), 120, Jan. 12, Con- [verting iron scraps, &c. into steel.
Fox, G., & J. H., 309, Jan. 27, Finishing woollen fabrics.
—— J. H. & G., 309, Jan. 27, Finishing woollen fabrics.
Foxwell, D., 282, Jan. 25, Shaping wire.
France, W. H., 104, Jan. 12, Combing wool, &c.
Francis, G. W., & Brownlow, D. R. (Lake), 340, Jan. 29, [Coating for metals.
Friedlander, J., & *Jachimovicq, C.*, 266, Jan. 23, Collect- [ing crops.
Furrell, E. W. (*Browne*), 241, Jan. 21, Stand for charts, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, A. L., & Harris, C., 405, Feb. 3, Dress improvers.
—— D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.) [Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Tele- [graphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for [wood, &c.
—— M., 173, Jan. 16, Railway wheels.
Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots [and shoes.
—— S., & Rees, E., 320, Jan. 28, Fire bars.
Garland, H. P., 229, Jan. 21, Sewing-machines.
—— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish- [ing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gaudefroy, C., 433, Feb. 5, Asphaltic fabric.
—— C., 434, Feb. 5, Quilted fabric.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
—— W. E. (*Cornely*), 306, Jan. 27, Edging machines.

Gedge, W.E. (*Gaudefroy*), 433, Feb. 5, Asphaltic fabric.
—— W. E. (*Gaudefroy*), 434, Feb. 5, Quilted fabric.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Geiger, T., & Niemann, G. (Hildebrandt), 316, Jan. 27,
[Tramways.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.
Gill, D., 268, Jan. 23, Deodorising sewer gases.
—— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer
[gases.
Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling,
[&c. beer.
Gilmore, J., 386, Feb. 2, Turning over leaves of music.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
—— W. & G , 179, Jan. 16, Railway signalling.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.
Gouverneur, H.G.,452, Feb. 6, Reeds for harmoniums, &c.
—— H. G., 453, Feb. 6, Reeds for harmoniums,&c.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
—— W., 129, Jan. 13, Soaps.
Greenwood, F. A., 467, Feb. 8, Spinning.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Grosclaude, L. A. (Weill & Harburg), 528, Feb. 12,
[Musical boxes, &c.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Haddan, J. C., & Smith, H., 412, Feb. 4, Carving forks.
Haggas, W., 285, Jan. 25, Looms.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hall, D. & J., 428, Feb. 4, Temples for looms.
—— J., 346, Jan. 29, Lime and cement kilns.
—— J. & D., 428, Feb. 4, Temples for looms.
—— W. J., Marshall, F. A., & Skinner, C. W., 530,
[Feb. 13, Feed heaters for boilers.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Halley, G., 444, Feb. 5, Nut blanks.
Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.
Handyside, H., 376, Feb. 2, Chains or cables.
Harburg, H., Weill, L., (*Grosclaude*), 528, Feb. 12,
[Musical boxes, &c.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.
—— *G. P., & Johnson, J. R.* (Morgan-Brown),2250,
[June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.
—— J., 147, Jan. 14, Sulphates.
Harper, R. R., 356, Jan. 28, Electric telegraph apparatus.
Harris, C., & Fyfe, A. L., 405, Feb. 3, Dress improvers.
Harrison, C., 363, Jan. 30, Umbrella runners.
—— G.W.(*Lake*),2774,Aug. 5(*App.* 6.)Harvesters.
—— S. L., 461, Feb. 6, Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine,G.(*McVicar & McVicar*), 27, Jan. 2, Teaching.
—— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.
—— G. (*Bradford & Ferry*), 484, Feb. 9, Filling
[and corking bottles.
—— G. (*Winchester & Phelps*), 485, Feb. 9, Rock
[drills.
—— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
—— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
—— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
—— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning
[bricks, &c.
—— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
—— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
—— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
—— G. (*Edson & Silliman*), 1677, May 5 (*App.*45.)
[Paddle wheels.
—— G. (*Lyman*)1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
—— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening
[cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving
[bed.
Hayward, G., Knap, C., & Taunton R. H., 208, Jan. 19,
[Wrought iron tubes.
—— P., & Middleton, W., 493, Feb. 10, Melting,
[&c. metals.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10, Horse-shoe and other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Henning & Schnabel (Brunner), 505, Feb. 11, Portable
[cranes.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Higgins, F., & Theiler, R., 423, Feb. 4, "Tell tale"
[clocks.
Higginson, A., 108, Jan. 12, Motive-power engines and
[pumps.
Hildebrandt, A.(*Niemann & Geiger*), 316, Jan. 27, Tram-
[ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13,
[Cartridges.
Hodson, C., 371, Feb. 1, Floor, sash, and bench cramp.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Holland, R., 393, Feb. 3, Fastening wheel tyres.
—— W., & *Myers, H.*, 34, Jan. 4. Umbrellas and
[parasols.
Hollerbusch, M. (Flachfeld), 440, Feb. 5, Pencils.
Holliday, T. (*Schultz*), 498, Feb. 10, Printing fabrics.
—— T. (*Schultz*), 499, Feb. 10, Bleaching fabrics.
Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing
[machinery.
—— R. R., 122, Jan. 13, Aërated liquors.
Holroyde, W. J., 469, Feb. 8, Dredger grapples.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other
[articles.
Hough, J. E., Rimington, J. McN., Shepherd, E., &
[Rothwell, F. & T., 350, Jan. 29, Sewing-
[machines.

Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
Deacon, H., 332, Jan. 28, Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or aërial apparatus.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving life at sea.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c. machines.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.) Sewing machines.
Devenport, C., 483, Feb. 9, Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308, Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308, Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and stuffing box.
Dignum, F. B., 515, Feb. 12, Breakers or water casks for boats.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
Dolne, L., 534, Feb. 13, Revolvers.
Dominy, G., & Russell, J., 398, Feb. 3, Guards for carving forks.
Donald, J., 532, Feb. 13, Stoking apparatus for furnaces.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
——— H. A. (*Dauner*), 438, Feb. 5, Horse collars.
Dumont, A., & Alfieri, E., 512, Feb. 11, Lockets.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H. (Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.) Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8, Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edison, T. A., 384, Feb. 2, Telegraphs.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677, May 5 (*App.* 45.) Paddle wheels.
Edwards, Edmund (*Boullenot*), 75, Jan. 8, Safety lamps.
——— Edmund (*Edwards*), 357, Jan. 30, Rollers for fabrics.
Edwards, Ernest (Edwards), 357, Jan. 30, Rollers for fabrics.
Edwards, W., 540, Feb. 13, Railway and other wheels.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Elce, J., 366, Feb. 4, Spinning and doubling.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Espir, C. (*Le Bricquir*), 291, Jan. 26, Mining powder.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or aërial apparatus.
Evans, I., 552, Feb. 15 (*App.* 7.) Handles for parcel and other straps, &c.
——— P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Farris, W. H. (Lake), 310, Jan. 27, Water circulating bars.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Carding, &c. fibres.
——— W. & J., & Newsome, C. H., 14, Jan. 1, Carding, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9, Filling and corking bottles.
Fewster, W., 293, Jan. 26, Saving life and property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Financière de Paris (la Société) (Johnson), 704, Feb. 25 (*App.* 6.) Treating alunite.
Fish, W. S., 9, Jan. 1, Packing for stuffing-boxes, &c.
Fisher, H., & Rutherford, J. H., 56, Jan. 6, Hot-air engines, &c.
Fitz, E. E., 187, Jan. 18, Mounting globes.
Fitz-Patrick, J. J. (Lake), 42, Jan. 4, Drawers.
Flachfeld, J. (*Hollerbusch*) 440, Feb. 5, Pencils.
Flagler, H. K. (Hunt), 290, Jan. 26, Welding tubes, &c.
Fliteroft, T., 102, Jan. 12, Carding engines.
Follett, J. L. (Murdoch), 1357 Apr. 14 (*App.* 42.) Sewing-machines.
Forges & Foundries Co. (Browne), 120, Jan. 12, Converting iron scraps, &c. into steel.
Foster, W. R., 10, Jan. 1, Railway breaks.
Fouillon, J. (Maes), 331, Jan. 28, Gloves.
Foundries & Forges Co. (Browne), 120, Jan. 12, Converting iron scraps, &c. into steel.
Fox, G., & J. H., 309, Jan. 27, Finishing woollen fabrics.
——— J. H. & G., 309, Jan. 27, Finishing woollen fabrics.
Foxwell, D., 282, Jan. 25, Shaping wire.
France, W. H., 104, Jan. 12, Combing wool, &c.
Francis, G. W., & Brownlow, D. R. (Lake), 340, Jan. 29, Coating for metals.
Friedlander, J., & *Jachimovicq, C.*, 266, Jan. 23, Collecting crops.
Furrell, E. W. (*Browne*), 241, Jan. 21, Stand for charts, &c.
Fürth, M. W., 1860, May 21 (*App.* 47.) Teasling apparatus.
Fyfe, A. L., & Harris, C., 405, Feb. 3, Dress improvers.
——— D. A., & Bowers, W. H., 101, Jan. 12, Gases.

G.

Galloway, C. J., & Holt, C. H., 2514, July 13 (*App.* 3.) Steam-boilers.
Gally, M. (Coddington), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Gandy, M., 52, Jan. 6, Paper material or substitute for wood, &c.
——— M., 173, Jan. 16, Railway wheels.
Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots and shoes.
——— S., & Rees, E., 320, Jan. 28, Fire bars.
Garland, H. P., 229, Jan. 21, Sewing-machines.
——— H. P., 2248, June 18 (*App.* 51.) Sewing-machines.
Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finishing fabrics.
Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.
Gaudefroy, C., 433, Feb. 5, Asphaltic fabric.
——— C., 434, Feb. 5, Quilted fabric.
Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.
Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.
——— W. E. (*Cornely*), 306, Jan. 27, Edging machines.

Gedge, W.E. (*Gaudefroy*), 433, Feb. 5, Asphaltic fabric.
—— W. E. (*Gaudefroy*), 434, Feb. 5, Quilted fabric.
Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.
Geiger, T., & Niemann, G. (Hildebrandt), 316, Jan. 27, [Tramways.
Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.
Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary [vessels.
Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4 [(*App.* 36.) Pumps.
Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop- [pering bottles, &c.
Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and [stuffing box.
Gill, D., 268, Jan. 23, Deodorising sewer gases.
—— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer [gases.
Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling, [&c. beer.
Gilmore, J., 386, Feb. 2, Turning over leaves of music.
Gilmour, T., 164, Jan. 15, Safety valves.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
—— W. & G , 179, Jan. 16, Railway signalling.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.
Gouverneur, H.G., 452, Feb. 6, Reeds for harmoniums, &c.
—— H. G., 453, Feb. 6, Reeds for harmoniums, &c.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans- [mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
—— W., 129, Jan. 13, Soaps.
Greenwood, F. A., 467, Feb. 8, Spinning.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Grosclaude, L. A. (Weill & Harburg), 528, Feb. 12, [Musical boxes, &c.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2, [Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Haddan, J. C., & Smith, H., 412, Feb. 4, Carving forks.
Haggas, W., 285, Jan. 25, Looms.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hall, D. & J., 428, Feb. 4, Temples for looms.
—— J., 346, Jan. 29, Lime and cement kilns.
—— J. & D., 428, Feb. 4, Temples for looms.
—— W. J., Marshall, F. A., & Skinner, C. W., 530, [Feb. 13, Feed heaters for boilers.
Hallett, G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Halley, G., 444, Feb. 5, Nut blanks.
Hamburg-American Sewing-Machine Co. (Jensen), 26, [Jan. 2, Printing metals.
Handyside, H., 376, Feb. 2, Chains or cables.
Harburg, H., Weill, L., (*Grosclaude*), 528, Feb. 12, [Musical boxes, &c.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
—— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250, [June 19 (*App.* 52) Tramway rolling stock.
Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.
—— J., 147, Jan. 14, Sulphates.
Harper, R. R., 356, Jan. 28, Electric telegraph apparatus.
Harris, C., & Fyfe, A. L., 405, Feb. 3, Dress improvers.
Harrison, C., 363, Jan. 30, Umbrella runners.
—— G.W. (*Lake*), 2774, Aug. 5 (*App.* 6.) Harvesters.
—— S. L., 461, Feb. 6, Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.* [36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
—— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.
—— G. (*Bradford & Ferry*), 484, Feb. 9, Filling [and corking bottles.
—— G. (*Winchester & Phelps*), 485, Feb. 9, Rock [drills.
—— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.) [Surfaces for steps, &c.
—— G. (*Cleveland Paper Box Machine Co.*), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
—— G. (*Toppan, Meloon, Chapin & Meloon*), 1009, [Mar. 18 (*App.* 38.) Wood-planing machines.
—— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning [bricks, &c.
—— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting [match splints.
—— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device [for holding thread, &c.
—— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork- [screws.
—— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.) [Paddle wheels.
—— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread [spools, pail-handles, &c.
—— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening [cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving [bed.
Hayward, G., Knap, C., & Taunton R. H., 208, Jan. 19, [Wrought iron tubes.
—— P., & Middleton, W., 493, Feb. 10, Melting, [&c. metals.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10, Horse-shoe and other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Henning & Schnabel (Brunner), 505, Feb. 11, Portable [cranes.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam- [boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Higgins, F., & Theiler, R., 423, Feb. 4, "Tell tale" [clocks.
Higginson, A., 108, Jan. 12, Motive-power engines and [pumps.
Hildebrandt, A. (*Niemann & Geiger*), 316, Jan. 27, Tram- [ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13, [Cartridges.
Hodson, C., 371, Feb. 1, Floor, sash, and bench cramp.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers [and other boilers.
Holland, R., 393, Feb. 3, Fastening wheel tyres.
—— W., & *Myers, H.*, 34, Jan. 4. Umbrellas and [parasols.
Hollerbusch, M. (Flachfeld), 440, Feb. 5, Pencils.
Holliday, T. (*Schultz*), 498, Feb. 10, Printing fabrics.
—— T. (*Schultz*), 499, Feb. 10, Bleaching fabrics.
Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing [machinery.
—— R. R., 122, Jan. 13, Aërated liquors.
Holroyde, W. J., 469, Feb. 8, Dredger grapples.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.) [Steam-boilers.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other [articles.
Hough, J. E., Rimington, J. McN., Shepherd, E., & [Rothwell, F. & T., 350, Jan. 29, Sewing- [machines.

Howard, J., & Cox, W., 277, Jan. 25, Saddle girth tighteners.
Howarth, A. & W., 322, Jan. 28, Dental lathes, &c.
—— J., 240, Jan. 21, Hot-air stoves.
—— W. & A., 322, Jan. 28, Dental lathes, &c.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stoppering bottles, &c.
Howland, R., 524, Feb. 12, Combined almanac, pencil case, &c.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
—— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
—— H., 372, Feb. 1, Steam-engines.
—— S., & Turner, J., 392, Feb. 3, Lamp burners.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19, Bale bands.
Humphries, G. G., & Hutchinson, T., 397, Feb. 3, Embroidering fabrics.
Hunt, B. (*Flagler*), 290, Jan. 26. Welding tubes, &c.
—— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-magnetic engines.
Hutchence, H., & Rider, F. W., 383, Feb. 2, Harmoniums, organs, &c.
Hutchinson, T., & Humphries, G. G., 397, Feb. 3, Embroidering fabrics.
—— W. N., 509, Feb. 11, Stirrups.
Huyttens, T. C. M. (Johnson), 445, Feb. 5, Bread.

I.

Imlay, C. G. (Lake), 253, Jan. 22, Preventing frand by tram-car conductors, &c.
Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.
Ingram, J. G., 235, Jan. 21, Washers and packing pieces.
Isherwood, S., & Weare, R., 326, Jan. 28, Carbonaceous material for filtering, &c.

J.

Jachimovicz, C., & Friedlander, J., 266, Jan. 23, Collecting crops.
Jackson, H., & Milburn, R., 518, Feb. 12, Treating salts, ores, &c.
James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
James, J., 284, Jan. 25, Railway carriages and wagons.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*) 26, Jan. 2, Printing metals.
—— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
—— P. (*Bohlken*), 295, Jan. 26, Washing machine.
—— P. (*Bohlken*), 307, Jan. 27, Earth-boring augers.
—— P. (*Baumotte*), 494, Feb. 10, Painters' easels.
—— P. (*Bürgin*), 506, Feb. 11, Increasing the adhesion of locomotive wheels on rails.
Jeyes, J., & Turner, C. H., 205, Jan. 19, Lubricator.
Johnson, G. (Clark), 199, Jan. 19, Rolling bars for nut blanks.
Johnson, J. C., 209, Jan. 20, Forming tube skelps.
—— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening drills.
—— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffering, &c.
—— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing fires.
—— J. H. (*Constant*), 301, Jan. 26, Connecting tubes to tube plates.
Johnson, J. H. (*Adamson*), 381, Feb. 2, Starch, &c.
—— J. H. (*Marot*), 408, Feb. 3, Saccharine solutions.
—— J. H. (*Lamarre*), 409, Feb. 3, Signalling and illuminating.
—— J. H. (*Huyttens*), 445, Feb. 5, Bread.
—— J. H. (*Société Financière de Paris*), 704, Feb. 25, (*App.* 6.) Treating alunite.
—— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Transmitting musical vibrations, &c.
—— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, June 9 (*App.* 50.) Writing, &c. by means of type.
—— *J. R., & Harding, G. P.* (Morgan-Brown) 2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, R., 400, Feb. 3, Obtaining motive-power.
—— S., & Allan, W., 191, Jan. 18, Heating feed water; condensing steam.
—— S. H., 156, Jan. 14, Cocks or valves.
Joliot, J. P. S., 204, Jan. 19, Railway breaks.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
—— E. A. & J. A., 956 Mar. 15 (*App.* 6.) Rotary puddling furnaces.
—— H., & Davies, J., 248, Jan. 22, Stoppering bottles.
—— H. L., 492, Feb. 10, Disinfectants and deodorizers.
—— J. A. & E. A., 956 Mar. 15, (*App.* 6.) Rotary puddling furnaces.
—— R. A., & Perry, J. J., 12, Jan. 1, Lighting cigars, &c.
—— T., 482, Feb. 9, Preserving and rendering wood uninflammable.
—— W. P., 510, Feb. 11, Fire-arms.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kaselowsky, E. (Pieper), 535, Feb. 13, Steam-boilers.
Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25 (*App.* 35.) Surfaces for steps, &c.
Kellogg, H. (Crosby), 324, Jan. 28, Fur coated fabrics.
—— *H.* (Crosby), 325, Jan. 28, Head coverings.
Kelly, S. J. J., 521, Feb. 12, Producing letters, &c. upon glass.
Kendrick, T., 31 Jan. 4, Coffin furniture.
Kennedy, J., & Wigg, C., 314, Jan. 27, Furnaces.
—— W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23, Boots.
Kidd, J., 531, Feb. 13, Gas.
—— J., & *Arnold, L.*, 66, Jan. 7, Gas.
Kirby, W., 503, Feb. 11, Coffins.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19, Wrought iron tubes.
Knaust, W. (Wirth), 439, Feb. 5, Valves.
Knelles, C. H. (Lake), 486, Feb. 9, Imitation leather, damask, &c.
Knip, J. F. (Bishop), 403, Feb. 3, Exhibiting pictures.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10 (*App.*-3.) Sugar.
Kosloff, S. A., 441, Feb. 5, Electric light.
Kosminski, M., 522, Feb. 12, Articles of dress for ladies.
Kritch, W. C., 464, Feb. 6, Cutting paper.
Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 19, Treating and dyeing vegetable textiles.
Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 19. Treating and dyeing vegetable textiles.

L.

Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
—— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
—— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
—— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
—— W. R. (*Whittemore*), 163, Jan. 15, Spikes.
—— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.
—— W. R. (*McClintock*), 207, Jan. 19, Preserving [substances.
—— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by [tram-car conductors.
—— W. R. (*Farris*), 310, Jan. 27, Water circulating [bars.
—— W. R. (*Brownlow & Francis*), 340, Jan. 29, Coating for metals.
—— W. R. (*Bogle*), 395, Brushing boots and shoes; [polishing, &c.
—— W. R. (*Osborne*), 417, Feb. 8, Harvesting machines.
—— W. R. (*Larkin*), 472, Feb. 8, Furnace grates.
—— W. R. (*Knelles*), 486, Feb. 9, Imitation leather, [damask, &c.
—— W. R. (*Lazar*), 536, Feb. 13, Railways.
—— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-[dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-[menageries.
—— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting [ores; making iron; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.) [Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather [pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing [electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-[boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18, [(*App.* 51.) Device for advertising.
—— W. R. (*Harrison*), 2774, Aug. 5 (*App.* 6.) Harvesters.
Lamarre, E. A. A. (Johnson), 409, Feb. 3, Signalling [and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing machines, &c.
Larkin, J. B. (Lake), 472, Feb. 8, Furnace grates.
Laslett, T. N., 523, Feb. 12, Measuring heights and [distances of objects.
Law, J. H., Redfern, T., & Smith, P., 431, Feb. 5, Paper [making.
Laycock, W. S., 478, Feb. 9, Electric breaks.
Lazar, A. (Lake), 536, Feb. 13, Railways.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14, [Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining [powder.
Lee J., 131, Jan. 13, Fire-arms.
— J. W., 481, Feb. 9, Rotary pumps.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Legat, D. M. (Clark), 463, Feb. 6, Sewing straw hats, &c.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181, [Jan. 16, Phosphates and phosphorus.
—— H., Box, J., Aubertin, E., & Boblique, L., 214, [Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévêque, A. J. J. (Dufrene), 195, Jan. 19, Railway [sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, G. H., 137, Jan. 13, Cigars.
—— R. T., 237, Jan. 21, Looking glasses and mirrors.
Liancourt, C. A. Count de G. de, 390, Feb. 3, Preserving [life at sea.
Lind, J., 457, Feb. 6, Securing ends of bale bands.
Lloyd, J., & Scully, J., 226, Jan. 20, Drying wall [papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Loebl, S., 614, Feb. 19 (*App.* 7.) Heating and cooking [apparatus.
Loewenberg, H., 420, Feb. 4, Imitation braids, leather, &c.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c., [threads; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Lontin, D. F. (Clark), 473, Feb. 8, Application of electro-[dynamic machines.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail [hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9, [Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing [slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and [axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.) [Thread-spools, pail-handles, &c.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.
—— W. A., 455, Feb. 6, Making alkali, &c.
—— W. A., 627, Feb. 20 (*App.* 7.) Alkali.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving [substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Compositions for paving, &c.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c. [waste products.
Mackay, M., 200, Jan. 19, Compounds for dissolving [resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing [instruments.
Maclaren, J., 415, Feb. 4, Watch protector.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M., [76, Jan. 8, Railway wheels and axles.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7; Crushing [stones, &c.
Maes, L. (*Fouillon*), 331, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Knenemann), 194, Jan. 19, [Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscriptions, &c.
Malo, G. (Clark), 404, Feb. 3, Ships or vessels.
Manbré, A., Beldam, W. A., & Allibon, G., 264, Jan. 23, [Steam-boilers.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard [railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.

Marchant, R. M., 304, Jan. 27, Furnaces.
Marillier, R. A., 497, Feb. 10, Raising, tipping and [lowering trucks.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marot, L. (Johnson), 408, Feb. 3, Saccharine solutions.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, F. A., Skinner, C. W., & Hall, W. J., 530, [Feb. 13, Feed heaters for boilers.
——— J., 162, Jan. 15, Thrashing machines.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-[dressing machines.
Martin, T., 468, Feb. 8, Lamps.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
——— W., & Cordillot, H. F. A., 479, Feb. 9, Steaming [printed fabrics.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted [fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.* [44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14 [(*App.* 46.) Hydraulic engines, &c.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.) [Applying oil painting to walls.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-[planing machines.
——— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.* [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-[planing machines.
Melvill, R. A., 554, Feb. 15 (*App.* 6.) Fastening win-[dows, &c.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
Middleton, W., & Hayward, P., 493, Feb. 10, Melting, [&c. metals.
Milburn, R., & Jackson, H., 518, Feb. 12, Treating salts, [ores, &c.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8 [(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
——— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Mitchell, J. & W., 410, Feb. 3, Umbrellas and parasols.
——— W. & J., 410, Feb. 3, Umbrellas and parasols.
——— W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20 [(*App.* 35.) Filtering water.
Monk, W., & Rawsthorne, T., 435, Feb. 5, Carding en-[gine rollers.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20 [(*App.* 35.) Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
——— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and [windows.
——— W. (*Crompton*), 146, Jan. 14, Looms.
——— W. (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
——— W. (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of [type.
——— W. (*Johnson & Harding*), 2250, June 19 [(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-[way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying [gas for aërial purposes.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and [utilizing steam
Mountford, E. C. & W., 292, Jan. 26, Games.
——— W. & E. C., 292, Jan. 26, Games.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit-[ting hats, &c.
Munn, A., Rennie, J., & Sutherland, J., 419, Feb. 4, [Sinking cylinders for foundations.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.) [Sewing-machines.
Murray, A. W., 382, Feb. 2, Lamps.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and [parasols.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Neil, C., 402, Feb. 3, Stocks and dies.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Newbold. E., 267, Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding, [&c. fibres.
Newton, A. V. (*Borchart*) 385, Feb. 2, Bullet patching [machinery.
——— H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding [engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27. [Tramways.
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Nussey, G. H., & Leachman, W. B., 139, Jan. 14, Punch-[ing and rivetting machines, &c.

O.

Olpherts, R., 560, Feb. 16 (*App.* 7.) Screw presses, &c.
Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13, [Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Osborne, D. M. (Lake), 471, Feb. 8, Harvesting ma-[chines.
Outerson, A. & J., 558, Feb. 16 (*App.* 34.) Filters.
——— J. & A., 558, Feb. 16 (*App.* 34.) Filters.

P.

Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine), [1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Parker, G., 556, Feb. 16 (*App.* 7.) Riddling and loading [coal, &c.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and [engines.
Payton, W., & Holmes, J. E., 343, Jan. 29, Sawing [machinery.
Pearson, D. R., 516, Feb. 12, Backs and handles for [brushes.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces, [purses, &c.

Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
——— W., 533, Feb. 13, Communicating in trains.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Petit, H. J., 501. Feb. 10, Sewing-machines.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485
[Feb. 9, Rock drills.
Pictet, R. P., 2727, Aug. 3 (*App.* 6.) Sulphurous acid;
[producing cold.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieper, C. (*Kaselowsky*), 535, Feb. 13, Steam-boilers.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drink-
[ing bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
——— R. P., 448, Feb. 6, Trapping waterclosets, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2,
[Preparing fibres for spinning.
Porter, E. B. (Clark), 1042, Mar. 22 (*App.* 7.) Screw
[propellers.
Porter, G., 430, Feb. 4, Gas-burners.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Venti-
[lating water closets, &c.
Pounsett, R., 447, Feb. 5, Vinegar.
Powleson, W. L., 2565, July 17, (*App.* 4.) Steam super-
[heaters.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Puente, S., 436, Feb. 5, Sheep shear.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank
[or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21, Creased or
[plaited fabrics.
Rawsthorne, T., & Monk, W., 435, Feb. 5, Carding en-
[gine rollers.
Read, W., 379, Feb. 2, Buttons; attaching same.
Reckendorfer, J. (Marler), 215, Jan. 20, Pencil cases.
Redfern, T., Smith, P., & Law, J. H., 431, Feb. 5, Paper
[making.
Redheffer, W. (Benson), 388. Feb. 3, Freezing, churn-
[ing, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit-
[ting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reeves, T., 424, Feb. 4, Sewing-machines.
Reid, W., 166, Jan. 15, Sewing machines.
Rennie, J., Sutherland, J., & Munn, A., 419, Feb. 4,
[Sinking cylinders for foundations.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201,
[Jan. 19, Railway signals and points.
——— G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for
[floors, &c.
Rider, F. W., & Hutchence, H., 383, Feb. 2, Harmo-
[niums, organs, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., &
[Hough, J. E., 350, Jan. 29, Sewing machines.
Roberts, A. & G., 636, Feb. 20 (*App.* 6.) Pianofortes.
——— G. & A., 636, Feb. 20 (*App.* 6.) Pianofortes.
——— W. A., & Tantum, A. J., 443, Feb. 5, Work-
[ing sewing-machines.
Robinson, C. E. (Clark), 338, Jan. 28, Feeding and
[burning oils in furnaces.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing
[machines, &c.
——— H. (*Mullholland*), 161, Jan. 15, Cut nails.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting
[ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
——— T. & F., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway
[signalling.
——— *D.* (Clark), 2740, Aug. 4 (*App.* 6.) Railway
[signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and
[forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
Russell, H., 109, Jan. 12, Registering garments, &c.
[sent to laundries.
——— J., & Dominy, G., 398, Feb. 3, Guards for carv-
[ing forks.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.
Rydill, G., 150, Jan. 14, Purifying sewage, &c.
———G., 399, Feb. 3, Purifying sewage, &c.

S.

Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
[cussion caps.
Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.
Savage, W. P., 271, Jan. 23, Preventing accidents on
[railways.
Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.
Scantlebury, W., & Rath, F., 232, Jan. 21, Creased or
[plaited fabrics.
Schnabel & Henning (Brunner), 505, Feb. 11, Portable
[cranes.
Schofield, C. J. 511, Feb. 11, Furnaces.
Schrebler, G., 477, Feb. 9, Pistons.
Schulte, A. (Vollmer), 460, Feb. 6, Copying ink pencil.
Schultz, A. (Holliday), 498, Feb. 10, Printing fabrics.
——— *A.* (Holliday), 499, Feb. 10, Bleaching fabrics.

Scott, G., 128, Jan. 13, Glass furnaces.
—— H. Y. D., 135, Jan. 13, Purifying gas.
—— H. Y. D., 373, Feb. 1, Manures.
—— J. (*Gerard*), 38, Jan. 4, Finishing fabrics, &c.
—— J. C., 170, Jan. 15, Moulding toothed wheels, &c.
—— J. P. (*Haag*), 236, Jan. 21, Heating railway
[carriages.
—— W. M., 186, Jan. 18, Fire-arms.
—— W. M., & Rigby, J., 312, Jan. 27, Fire-arms.
Scully, J., & Lloyd, J., 226, Jan. 20, Drying wall papers, &c.
Sellars, J. C., 112, Jan. 12, Cement.
Serrière, J., 242, Jan. 21, Furnaces.
Sewing-Machine Co., Hamburg-American (Jensen), 26,
[Jan. 2, Printing metals.
Shand, G., 213, Jan. 20, Maturing spirits, wines, &c.
Shanks, F., 1507, Apr. 23 (*App.* 43.) Carriages.
Shann, G., 458, Feb. 1, Steam traps.
Share, H. H., & Calley, S., 377, Feb. 2, Raising, &c., boats.
Shaw, E., 546, Feb. 15 (*App.* 7.) Wheels.
—— J., 368, Feb. 1, Steam-boilers.
Sheffield, J., 411, Feb. 4, Glass furnaces.
Shepherd, E., Rothwell, F. & T., Hough, J. E., & Riming-
[ton, J. McN., 350, Jan. 29, Sewing machines.
Siemens, C. W., 43, Jan. 5, Furnaces.
Siggery, E. C., & Redman, T. B., 273, Jan. 23, Couplings.
Silcox, D. S. (Lake), 5, Jan. 1, Kindling fires.
Silliman, C. H., & Edson, N. T. (Haseltine), 1677,
[May 5 (*App.* 45.) Paddle wheels.
Simmons, C., 65, Jan. 7, Steam-boilers.
—— J., & Morris, J. M., 289, Jan. 25, Purifying gas
[for aërial purposes.
Sington, T., 57, Jan 6, Railway signals.
Sinibaldi, G. R. F., & *Sinibaldi, P.*, 136, Jan. 13, Pre-
[venting formation and explosion of
[gas in storage, &c. of gaseous liquids.
Sinibaldi, P., & Sinibaldi, G. R. F., 136, Jan. 13, Pre-
[venting formation and explosion of
[gas in storage, &c. of gaseous liquids.
Siprell, D. W. (Mills), 246, Jan. 22, Rock reamers, &c.
Skinner, C. W., Hall, W. J., & Marshall, F. A., 530,
[Feb. 13, Feed heaters for boilers.
Smellie, W., & Perkins, S., 218, Jan. 20, Furnaces.
Smith, H., & Haddan, J. C., 412, Feb. 4, Carving forks.
—— H. N., 520, Feb. 12, Hot-water apparatus.
—— J., 466, Feb. 8, Mechanical stokers.
Smith, J. & R. (Abel), 244, Jan. 22, Steam-boilers.
Smith, J., & Vicars, T. & T., 529, Feb. 13, Furnaces, &c.
Smith, J. H., 121, Jan. 13, Sewing-machines.
—— J. H., 634, Feb. 20 (*App.* 5.) Sewing machines.
—— J. N., 126, Jan. 13, Railway journal boxes.
—— P., Law, J. H., & Redfern, T., 431, Feb. 5, Paper-
[making.
Smith, R. & J. (Abel), 244, Jan. 22, Steam-boilers.
—— *V.* (Thayer), 2513, July 13 (*App.* 3.) Compound
[for dental plates, &c.
Smith, Walter, 450, Feb. 6, Blowing glass.
—— William, & Pieri, P., 342, Jan. 29, Bidon and
[drinking bottle.
Smith, W. H., 217, Jan. 20, Metals and alloys.
Smythe, E. T. (Haseltine), 422, Feb. 4, Balanced slide-
[valves.
Snelus, G. J., 500, Feb. 10, Extracting metallic com-
[pounds from solutions and separating the metals.
Solet, F., & Mathian, V. (Abel), 1545, Apr. 27 (*App.* 44.)
[Heating air, &c.
Spence, H. G., 427, Feb. 4, Fitting pipes, &c. to ships.
Spencer, C. M., 893, Mar. 10 (*App.* 37.) Screws.
—— S., & Gillman, A. W., 234, Jan. 21, Bottling, &c.
[beer.
Speyer, M., 305, Jan. 27, Portable sheds or tents.
Stableford, W., 1098, Mar. 25 (*App.* 39.) Railway wheels.
Standfield, J., & Clark, J. L., 514, Feb. 11, Floating docks
[and pontoons.
Staniland, J. T., 134, Jan. 13., Perambulator brakes.
Stark, W., 370, Feb. 1, Breadthening and drying fabrics.
Steel, J., 333, Jan. 28, Actuating brakes by compressed air.
Steinbach & Co. (Beck), 394, Feb. 3, Saddle girths.
Sterne, L., 83, Jan. 9, Railway couplings.
Stevenson, G., 387, Feb. 3, Mining; steam-engines, &c.
Stock, E., & Buckley, J. B., 378, Feb. 3, Stench traps.
Stockman, B. P., 255, Jan. 22, Electric signalling.
Stockley, J., 358, Jan, 30, Preventing priming in boilers.
Stokes, E. P., 143, Jan. 14, Boat-lowering apparatus.
—— R., & Goff, R., 254, Jan. 22, Busk fastenings, &c.
—— W. H., 446, Feb. 5, Breaks for carriages, &c.
Stormont, J. G., 1, Jan. 1, Call-bell and actions.
Stratton, J. F. (Barlow), 407, Feb. 3, Indicating water
[level, &c.
Stringfellow, H. W., 25, Jan. 2, Drain pipes.
Stuart, C., 442, Feb. 5, Stop valves, &c.
—— C., 537, Feb. 13, Safety valves for boilers.
Sutherland, J., Munn, A., & Rennie, J., 419, Feb. 4,
[Sinking cylinders for foundations.
Sutro, H. (Haseltine), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
Swarbrick, R., 491, Feb. 10, Fire-proof flooring.

T.

Taft, O. W. (Clark), 1153, Mar. 30 (*App.* 40.) Table
[cutlery and handles.
Tanner, B., 279, Jan. 25, Treating ores and minerals.
Tatum, A. J., & Roberts, W. A., 443, Feb. 5, Driving
[sewing-machines.
Taunton, R. H., Hayward, G., & Knap, C., 208, Jan. 19,
[Wrought iron tubes.
Tavernier, L. F., & Mathieson, J. P., 361, Jan. 30,
[Felted fabrics.
Taylor, G. N. (*Taylor*), 192, Jan. 18, Lamps.
—— R., 321, Jan. 28, Tapping screw-threads.
Taylor, R. N. (Taylor), 192, Jan. 18, Lamps.
Temple, T., 391, Feb. 3, Railway breaks.
Terrell, T., 519, Feb. 12, Tin plates.
Thayer, L. O., 454, Feb. 6, Fire-arms.
—— L. O. (*Smith*), 2513, July 13 (*App.* 3.) Com-
[pound for dental plates, &c.
Theiler, R., & Higgins, F., 423, Feb. 3, "Tell-tale" clocks.
Thiery, C. L., 2367, June 29 (*App.* 1.) Watch cases, &c.
Thompson, E., 180, Jan. 16, Rafts and ships' boats.
Thornley, G., & Buxton, T., 188, Jan. 18, Casks.
—— G., & Buxton, T., 1518, Apr. 26 (*App.* 44.)
[Jointing cask staves.
Tildesley, M., 8, Jan. 1, Door bolts.
Tilley, W., 635, Feb. 20 (*App.* 7.) Photography.
Todd, L. J., 355, Jan. 30, Locomotive carriages, &c.
Tomkins, A. S., 114, Jan. 12, Cooking stoves.
Tomlinson, J., 401, Feb. 3, Preparing fibres.
Tomlinson, O. (North), 130, Jan. 13, Axle-boxes.
Topp, A. & N., & Nicholson, E., 283, Jan. 25, Carding
[engines.
—— N. & A., & Nicholson, E., 283, Jan. 25, Carding
[engines.
Toppan, D. L., Chapin, G. B., & Meloon, D. C. & H. H.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Toppin, P., & Longsdon, D., 176, Jan. 16, Horse-shoes.
Torr, C. W., & Atkins, J., 594, Feb. 18 (*App.* 7.)
[Gasaliers, chandeliers, &c.
Tournier, F. A. (Imray), 212, Jan. 20, Masticating,
[&c. food.
Tower, B., Deverell, W. T., & *Deverell, S. R.*, 308, Jan. 27,
[Motive-power.
Trabue, 661, Feb. 23 (*App.* 35.) Needles.

Trottier, E., 488, Feb. 10, Removing grease from tin and
[terne plates.
Tucker, T. M., & Lowerre, A. H. (Johnson), 85, Jan. 9,
[Goffering, &c.
Turner, A., 154, Jan. 14, Elastic fabrics.
——— C., 426, Feb. 4, Coupling broken shafts.
——— C. H., & Jeyes, J., 205, Jan. 19, Lubricator.
——— J., & Hughes, S., 392, Feb 3, Lamp burners.
Turnock, J., 51, Jan. 5, Steam-engines.
Tyer, E., 449, Feb. 6, Galvanic batteries.

U.

Ure, A., 456, Feb. 6, Smelting ores.

V.

Vallet, L., 490, Feb. 10, Bottle stoppers.
Valpy, H., & Burrell, P., 275, Jan. 25, Railway car-
[riages; tyres.
Van Haagen, C. (Johnson), 47, Jan. 5, Sharpening drills.
Varley, C. F., 303, Jan. 27, Propeller shafts, &c.
——— F. H., 276, Jan. 25, Propeller shafts, &c.
Vaughan, E. P. H. (*Blot*), 37, Jan. 4, Presses.
——— E. P. H. (*Maynard*), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls, &c.
Vera, P., 175, Jan. 16, Gas or hot-air engines.
Vere, C. E. Hope-, 183, Jan. 18, Cleansing china and
[other articles.
Vicars, T. & T., & Smith, J., 529, Feb. 13, Furnaces, &c.
Vigné, W. (Weatherdon), 107, Jan. 12, Disinfectant.
Vollmer, H. (*Schulte*), 460, Feb. 6, Copying ink pencils.
Von Faber, J. L., 178, Jan. 16, Pencils.
Vosper, C. W., & Rogers, G. P., 251, Jan. 22, Sewing
[machines, &c.

W.

Wackett, J., 68, Jan. 7, Slaughtering animals.
Wadsworth, J., 418, Feb. 4, Bottle stoppers.
Walbank, J., & Bradley, J., 389, Feb. 3, Spinning.
Walker, S., Gibson, J., & Howitt, T., 103, Jan. 12,
[Stoppering bottles, &c.
Walkington, W., 541, Feb. 13, Wheel or roller skates.
Waller, G., 184, Jan. 18, Gas.
Walton, T., 299, Jan. 26, Locks.
Ward, S., & Lœwenstein, D., 78, Jan. 8, Doubling, &c.
[threads; stop motions.
Warren, F. P., Brodie, W., Wilson, M., & McLay, J. C. S.,
[76, Jan. 8, Railway wheels and axles.
Warschawsky, J., & Zysell, F., 347, Jan. 29, Pressing
[or ironing.
Waugh, J., 15, Jan. 1, Closing and opening bottles.
Wavish, J., 39, Jan. 4, Fire-places.
Weare, R., 252, Jan. 22, Extinguishing fire in ships, &c.
——— R., & Isherwood, S., 326, Jan. 28, Carbonaceous
[material for filtering, &c.
Weatherby, C.P.N., 351, Jan. 29, Ice; cooling buildings, &c.
Weatherdon, B. F. (*Vigné*), 107, Jan. 12, Disinfectant.
Webb, F. W., 462, Feb. 6, Railway points and signals.
Webb, J., & Leach, R., 257, Jan. 22, Embroidering.
Weber, C. P., & Portait, E. P. E. (Clark), 28, Jan. 2.
[Preparing fibres for spinning.
Webster, L., 459, Feb. 6, Fulling fabrics.
Weill, L., & Harburg, H. (*Grosclaude*), 528, Feb. 12,
[Musical boxes, &c.
Weldon, C. J., 77, Jan. 8, Clasps or buckles.
Westerby, J., & Broadbent, T., 231, Jan. 21, Valves.
Westwood, J., & Baillie, R., 341, Jan. 29, Corrugated
[iron plates.
Wetton, C. E., 359, Jan. 30, Boots and shoes.
Wheeler, W. F., 1592, Apr. 30 (*App.* 44.) Device for
[holding fertilizers, &c.
Whittaker, T., Duxbury, J., & Clayton, J., 73, Jan. 8,
[Bricks, tiles, &c.
Whittemore, A. (Lake), 163, Jan. 15, Spikes.
Whyte, A. C., 487, Feb. 10, Saving life from shipwreck.
Wicks, J. F. (Benson), 1139, Mar. 30 (*App.* 7.) Looms.
Wicks, J. F. (Benson), 1199, Apr. 2 (*App.* 40.) Pattern
[chains for looms.
Wier, M. A., 504, Feb. 11, Measuring flow of liquids.
Wigg, C., & Kennedy, J., 314, Jan. 27, Furnaces.
Wigham, J. R., 356, Jan. 30, Fog and other signals.
Wilcke, H., 4, Jan. 1, Propelling screw steam ships.
Wilcox, M., 406, Feb. 3, Combined seal and watch key.
Wilkinson, A., 60, Jan. 6, Compounds for paving, fuel, &c.
——— – J. F., 380, Feb. 2, Obtaining motive-power.
Willans, J. G., 157, Jan. 14, Furnaces.
Williams, H., & Evans, P., 22, Jan. 2, Stoppering bottles.
Williams, I. F. (Benson), 437, Feb. 5, Boots and lasts.
Williamson, C., 82, Jan. 9, Stays and corsets.
Willis, J., 298, Jan. 26, Umbrellas and sunshades.
Wilmart, O. J., 1085, Mar. 24 (*App.* 39.) Welding wrought
[iron and steel.
Wilson, A. (Lake), 2234, June 17 (*App.* 51.) Steam-boiler
valves.
Wilson, M., McLay, J. C. S., Warren, F. P., & Brodie, W.,
[76, Jan. 8, Railway wheels and axles.
Wilson, T. W., 474, Feb. 8, Cleaning bottles.
——— W., & Battersby, J., 375, Feb. 2, Cutting and
[pulping roots.
Winchester, E. S., & Phelps, H. W. (Haseltine), 485,
[Feb. 9, Rock drills.
Winder, R., 74, Jan. 8, Distributing type.
Wirth, F. (*Emmerich*), 193, Jan. 18, Fire-arms.
——— F. (*Leiter*), 296, Jan. 26, Electric apparatus.
——— F. (*Knaust*), 439, Feb. 5, Valves.
Wise, W. L. (*Levet*), 3, Jan. 1, Boring rock, &c.
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3. Reprint of leaf (pages 47–48) with Abridgment No. 222 of the year 1875 inserted. To be substituted for the corresponding leaf in No. 4, Chronological and Descriptive Index for 1875, which was published before the Abridgment No. 222 could be printed.

4. Appendix to Chronological and Descriptive Index, containing the Abridgments open to public inspection before the expiration of the term of six months, and also the Abridgments of Complete Specifications received from August 7 to August 13, 1875.

5. Index of Names to Chronological and Descriptive Index from January 1 to February 13, 1875, and to Appendixes from February 14 to August 13, 1875.

6. Index of Subject-matter to Chronological and Descriptive Index from January 1 to February 13, 1875, and to Appendixes from February 14 to August 13, 1875.

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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 14 to February 20, 1875.

A.D. 1875, February 15.—No. 542.

KAULBACH, Edward, of 21, Gower Street, Bedford Square, in the county of Middlesex, gentleman. —"A new and improved rotatory engine."

The chief features of novelty that characterize this invention, which is an improvement on the engine described in my Specification numbered 1983 and dated the 19th of June, 1868, are as follows:—

1°. The articulated parallelograms are dispensed with.

2°. The "blocks" or "fulcra" are replaced by slide valves.

3°. The "valves" which I now call pistons are reduced in number and are made fixtures.

4°. The cams also are reduced in number in proportion to the number of the pistons, and are fixed to the wheel instead of being movable.

A.D. 1875, February 15.—No. 543.

SHAW, John William, of Longwood, in the county of York, cotton spinner.—"Improvements in the "method of and apparatus for cutting off steam in the cylinders of steam engines."

In a metal framework fixed to any convenient part of the engine I fix a shaft to which motion is imparted from the crank shaft in the ordinary manner. On to the first named shaft I fix an eliptical wheel which gears into another eliptical wheel secured on an intermediate shaft on which is secured a spur pinion gearing into a wheel secured to a shaft on which is a tappet; the eliptical wheels are so arranged to give the tappet a quick motion at the time steam should be admitted into the cylinder the said tappet presses against a lever and opens the steam ports wide and which remain open until the tappet has passed the lever when the valve closes and remains so until a second tappet which revolves in the opposite direction opens the ports communicating with the condenser and gives access for steam to escape.

A.D. 1875, February 15.—No. 544.

CLARK, Adolphus, of 46, Frith Street, Soho Square, in the county of Middlesex, manufacturer.—(*A communication from Gustavus Davis Dows, of Boston, Massachusetts, United States of America.*)—"An "improved treadle apparatus."

The said improved apparatus consists essentially of a foot-lever connected by a rod to a friction pawl arranged to act upon a circular flange or hoop attached to a toothed wheel which is geared into a small pinion on a fly wheel shaft, whereby motion is imparted by a pulley and belt or by other suitable means to the sewing or other machine to which the said apparatus is applied.

A.D. 1875, February 15.—No. 545.

TURNER, Charles Hamilton, of Great Winchester Street, in the city of London, merchant and manufacturer.—"A new apparatus for improving the draught of chimneys and preventing their "smoking."

My said invention relates to a new and simple apparatus to be placed in a chimney to ensure the maintenance of a proper and regular draught through the same and to prevent its smoking no matter what may be the direction or force of the wind or the condition of the atmosphere.

A.D. 1875, February 15.—No. 546.

SHAW, Edward, of the city of Manchester, in the county of Lancaster, perambulator manufacturer. —"Improvements in wheels for perambulators, velocipedes, and all descriptions of carriages or "vehicles."

The felloe of each wheel is made of T or ⊔ shaped iron and drilled or bored at suitable distances apart perforations into which is fastened by rivetting or other well known means; one end of a number of metal rods or spokes, and one end of half the number are fixed to a central disc and hub, and the other half to another central disc and hub, the two discs and hubs being used instead of the ordinary nave or hub made in one piece.

The two discs and hubs are separated from each other according to the size of the wheel, and in the space between the two a screw and nut is placed, each having a hole for the axle to pass through, so that by turning the nut or screw in the proper direction the two discs and hubs can be widened from each other and thereby give the rods or spokes any required amount of rigidity or tension, there being lock nuts or keys when necessary to keep the parts firmly in their places; and when desired a tubular block and wedge is used instead of the screw and nut.

A.D. 1875, February 15.—No. 547.

OSMOND, John, of Breakspeare Road, New Cross, in the county of Kent.—"Improvements in dog-carts and other two-wheeled conveyances."

According to this invention the body of a dog-cart or other two wheeled vehicle is supported by trunnions carried in brackets on the shafts, so that when the latter are inclined by the falling of the horse, the body remains in a horizontal position. The body is locked to the shafts by means of two pawls carried by the former in gear with a toothed rack on the latter, which pawls are acted upon by a pendulum suspended from the body in such manner that on the horse falling, the pendulum swings forward and disengages the one ratchet thus allowing of the before described relative movement between the body and the shafts.

A.D. 1875, February 15.—No. 548.

HESLING, John, of Leeds, in the county of York.—"Improvements in fulling or milling machines."

A pair of rollers or cylinders, mounted one above the other, with confining spout and throat, another roller is mounted below the first lower roller, and in connection with it there is a confining spout caused to rise and fall with varying thicknesses of material. The material passes between top roller through confining spout, and thence by other rollers between middle and lower adjustable roller, thence to the lower confining spout, and so on until the milling and fulling is completed.

A.D. 1875, February 15.—No. 549.

BROWN, John, of the city of Glasgow, in the county of Lanark, North Britain, engineer.—"Improvements in machinery or apparatus for the manufacture of confectionery."

This invention consists of an improved construction of an angled revolving pan for making the rolled or rounded sugar-coated confections; and of its motive high-pressure oscillating steam engine combined, all portable or carried on one frame, the exhaust steam of the engine being blown into the casing of the pan to heat it, and the confections being treated therein. And further, in an improved construction and arrangement of steam boiler for generating the steam to drive the engine of this and other such confectionary pans, consisting of a flat round-ended boiler, with the usual sugar boiling fires within it, which heat this boiler, and a horizontal tubular boiler placed with its end abutting against the side of the former, so that the flames thereof pass through the tubes of the latter, and the upper and lower water spaces of both boilers are connected to give perfect circulation.

A.D. 1875, February 15.—No. 550.

BYRON, George Gordon de Luna, of New York, in the United States of America, but at present of 33, Chancery Lane, in the county of Middlesex, Colonel in the United States Army.—(*A communication from George Godley, of New York, in the United States of America.*)—"Improvements in or in connection with springs for railway and other carriages and wagons."

1st. A metal carriage spring, having flat surfaces, and a web or webs having a less thickness beyond such surfaces.

2nd. A spiral metal carriage spring formed of a bar, having one portion thinner in cross section than the rest, and then coiled with such thin part in the interior or exterior of the coil.

3rd. A spring made of a bar of metal rolled into an irregular shape or form consisting of a thick and thin part or bar.

A.D. 1875, February 15.—No. 551.

WOODWARD, Henry Franklin, of the city and State of New York, United States of America.— —"Improvements in overalls for workmen and others."

This invention relates to overalls made with jackets and trousers in one, the garment extending from the ankles to the shoulders, open down the front, and provided with jackets and a waist belt. It is generally preferable to cut the cloth, so that it passes over the shoulder without seam and is united behind at the waist.

These overalls retain the under garments and do not open at the waist by the movements of the body.

A.D. 1875, February 15.—No. 552.

EVANS, Isaac, of Birmingham, in the county of Warwick, manufacturer.—"Improvements in the " construction and manufacture of handles for rug, shawl, parcel, and other straps, bags, portman- " teaus, and for other like articles."

This invention consists in making the grip of the said handles and the eyes or loops at the ends thereof through which the straps are passed from sheet metal. The grip part and loop parts are either made from one piece of sheet metal, preferably sheet iron, or are made separate. When the loops are made separate they are either rigidly connected to the grip part or are jointed thereto. The grip part has either a cylindrical or trough form. The metallic handles so made are finished by painting or japanning, or are covered with leather. Swivelling **T** pieces are attached to the loop parts of the handle to facilitate the fastening and unfastening of the shoulder strap, sometimes used for carrying a rug or shawl about the person.

A.D. 1875, February 15.—No. 553.

SHONE, Charles George, and **WALKER**, Richard, both of Southall, in the county of Middlesex.— " Improvements in apparatus for communicating between passengers and drivers of railway trains."

This invention has for its object the production of simple and comparatively inexpensive apparatus for signalling or communicating between passengers and drivers of railway trains, and consists in fixing to the frame or lower part of each carriage two pipes (by preference iron gas-tubing) near to each other, and connecting them together by a cross piece of pipe having a cock or valve inserted therein. To the cock or valve a wheel or lever is fastened, and to the wheel or lever a cord or cords are attached, the ends of the said cords terminating in each compartment of a carriage, and accessible to the passengers. At both ends of each carriage the pipes or tubes are made to project, and are each provided with a cock, having fixed thereto a lever common to both, so that upon raising or lowering the lever both cocks may be opened or closed. The connectors for coupling the pipes between any two carriages are made of flexible tubing, furnished with sockets at the ends, which slide on to the spigot ends of the cocks, and are retained there by means of the lever of the cock which takes into a recess provided for the purpose, a close joint being formed by india rubber or other washers placed between the sockets and flanged spigots.

Attached to the engine is a small air-pump and chamber furnished with a safety valve and pressure guage, and to this chamber is connected the end of one of the pipes before mentioned, the other pipe being connected to a whistle on the engine.

The action of the apparatus is as follows :—When a train is being made up, connectors are placed between each carriage and attached thereto as before explained, the action of attaching being made to open each cock. When all the connectors are properly fixed, and the tubes placed in communication with the air chamber, the engine will, on starting, commence to fill the air chamber with compressed air, and will continue to do so, so long as it is in motion, producing no perceptible effect beyond that indicated by the pressure guage, but on any occurrence taking place necessitating a communication from the passenger to the driver, the former will pull the cord, which, acting through bell cranks or other similar contrivance, will open the cork connecting the two pipes together, when the air circuit will be completed, and the whistle on the engine sounded, the sound being continued until the train is stopped. Should a carriage by accident break away, the loss of pressure would be immediately indicated on the pressure guage, and attract the attention of the driver.

In the case of slip carriages, a cord is attached to the lever of the cocks of the carriage in advance, and on being pulled by the guard, will shut the cocks and release the connector from the adjoining carriage, when the train will proceed without opening the air circuit or causing the pressure guage to fall.

A.D. 1875, February 15.—No. 554.

MELVILL, ROBERT ALEXANDER, of Essex Road, Islington, in the county of Middlesex, ironmonger.—"Improvements in apparatus for fastening windows, which apparatus is also applicable for other "fastening purposes."

An arm turning on a pivot is formed with a saddle clip or claw in which a pin works, and which travels over blocks or arcs having openings or sockets to receive the pins.

A D. 1875, February 15.—No. 555.

GARNIER, EDME MARIA THOMAS, of Great Marlborough Street, in the county of Middlesex.—"Improvements in spring fastenings for wearing apparel, said fastenings being also applicable for other "uses."

This invention mainly consists in constructing (in the case of sleeve links) the two studs forming the link and joining them together in front by any suitable ornamental device, so that in effect the appearance will be as in the ordinary links but by the connection they will be as one link. To the back of one of these studs a projection is made and so formed as to catch into (when the fastening is effected) an opening made in a spring clip which is hinged to the back of the other stud. This spring clip or catch is formed at the ends with a slit right through. Similiar arrangements are also applied to fasteners other than for sleeve links as above described.

A.D. 1875, February 16.—No. 556.

PARKER, GEORGE, of Denaby, in the county of York.—"An improved machine or apparatus for "'riddling' and loading coal or other minerals."

This invention has for its objects the lessening of the manual labor required to load coal and the effecting of the screening thereof at the time of loading.

The machine or apparatus is constructed with octagonal shaped wheels on shafts, to which motion is imparted by suitable gearing.

Round these wheels are passed endless chains, across which are fastened projecting bars perforated with openings.

This arrangement is carried by a suitable framing fitted with wheels.

The coal is placed by manual labor only on to the lowermost of the bars, to which the operation of the octagonal shaped wheels gives a forward and jerking motion, which riddles the small from the serviceably sized coal through the perforations of the bars, and carries the useful coal up to the top level of the corf or other receptacle into which it falls.

A.D. 1875, February 16.—No. 557.

HICKISSON, JAMES, of Southgate Road, Hackney, in the county of Middlesex, marking ink manufacturer.—"Improvements in receptacles mainly applicable for showing or exhibiting articles for "sale, and in compositions for the manufacture thereof."

Frames, stands, cases, or sockets are made of plaster, cement, clay, or like material. Cotton waste, flock, fluff, paper pulp, sawdust, and other fibrous substances may be combined therewith. Glass is used. The frame or case can be moulded in halves or sections, and formed or ornamented with devices or designs.

A.D. 1875, February 16.—No. 558.

OUTERSON, JOHN, and OUTERSON, ANDREW, of Windsor Locks, county of Hartford, state of Connecticut, United States of America, paper makers.—"An improved filter."

This is an improved filter for water and other liquids that do not act distructively in any material. The material is disintegrated paper stock washed clean, puferably made by cutting, boiling, washing, and bleaching rags, or for paper making, though other material, as jute, flax, hemp, rope, and the like, can be used. The medium is put into a vessel with a strainer bottom and the water run through it, there being a ledge or shelf all around the inside of the vessel to catch any sand or grit which may work down at the sides.

A.D. 1875, February 16.—No. 559.

GOODWIN, William, of Liverpool, in the county of Lancaster, corn merchant.—" Improvements " in apparatus for facilitating the transfer or conveyance of grain, salt, and bulk substances."

The object of the invention is to facilitate the conveyance of bulk cargo from a ship, quay, or other place, to a warehouse or store-room, when sacks or containers and carrying vehicles are employed.

1st. Portable apparatus of novel construction is used with endless bucket or other elevators.

2nd. The portable apparatus consists mainly of a platform on wheels having a hopper to receive from the elevator over the platform, the said platform being fixed at the height of the floor of a lorry or vehicle, or made adjustable. Sacks or containers on the platform are filled from the said hopper through a shoot. A vibrating screen is placed in the hopper if desired.

3rd. The hopper and elevator are made portable together, and when required for use placed close to the platform apparatus.

4th. Weighing apparatus is used in combination with the apparatus above described.

A.D. 1875, February 16.—No. 560.

OLPHERTS, Richard, of Ardee, in the county of Louth, Ireland.—" Improvements in apparatus for " exerting pressure or power by means of screws, specially applicable to screw presses."

This Provisional Specification describes the employment of anti-friction rollers to diminish friction in screw presses and in other apparatus for exerting pressure or power by means of screws.

A. D. 1875, February 16.—No. 561.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Oscar Oexle, of Augsburg, Bavaria.*)—" Improvements in grinding or preparing " corn or similar substances and reducing the same into flour, and in the machinery or apparatus " employed therein."

This invention relates to an improved mode of and apparatus for preparing grain and reducing the same into flour, and has for its object the production of flour of superior quality by a continuous process with less power than is required by the ordinary system, and without the necessity for heating the meal.

A.D. 1875, February 16.—No. 562.

SECCOMBE, James, of Fenchurch Street, in the city of London, and **TALLING, Richard**, of Lostwithiel, in the county of Cornwall.—" A new or improved material or composition for covering steam " boilers and other places to prevent the radiation of heat therefrom."

This consists in the employment of mica and species thereof in combination with clay or other suitable mixing material.

A.D. 1875, February 16.—No. 563.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Farnham Maxwell-Lyte, of Paris, France.*)—" Improvements in the production of " ammonia."

The invention consists in the special reaction of nascent hydrogen produced in presence of a triad or pentad element and nitrogen for the production of ammonia by synthesis of its elements.

A.D. 1875, February 16.—No. 564.

RICHARDSON, John, engineer to the firm Robey and Company, Limited, Perseverance Works, Lincoln, and **BALL, Charles Julius**, of 21, New Bridge Street, Blackfriars, in the city of London, civil engineer.—" Improved arrangements of engine and boiler, with air or gas compressing apparatus " in combination."

This consists in combining a horizontal or a vertical steam generator with a base plate, which forms the water tank, such foundation also supporting the steam engine proper, and an air compressing engine in a compact manner, the whole being upon the foundation plate as part thereof.

A.D. 1875, February 16.—No. 565.

BELL, Joseph May, of 12, Church Street, Greenwich, in the county of Kent.—"Improvements in "stands or apparatus for holding books, papers, and other articles, and also for adjusting the same."

This relates to stands on or to which book holders, also glasses and other frames can be fitted or attached, such frames being capable of a swinging, and also a tilting, and a rising and falling action to suit the desired position at which the frames have to be adjusted.

A.D. 1875, February 16.—No. 566.

GETHING, William Burford, of 75, Fleet Street, in the city of London, chemist.—"Improvements "in filters and percolators."

I form the body of the filter or percolator in the form of an inverted cone, into the bottom of which I insert or place a piece of perforated metal or other material to act as a strainer to the said filter or percolator. I place a metal cover with screw cap inserted, and at the bottom of the said filter I put a funnel, so that it can be put into a bottle or other narrow mouthed vessel, the said filter or percolator may be made of tinned iron or other metal, and japanned or otherwise ornamented to protect it from damage or corrosion. The advantages I claim are that it (the filter) will always keep the liquor free from dust or dirt or evaporation while in process of filtration.

A.D. 1875, February 16.—No. 567.

DIXON, George, of York, in the county of York, and MADDOX, John, GARDNER, Edward, and HUGHES, Thomas, of Bethnal Green, in the county of Middlesex.—"Improvements in the manufac- "ture of upholstery and other fringes, and in the apparatus and mechanism used therein."

This invention mainly relates to the manufacture of upholstery and other fringes by a system of interweaving, which is performed wholly or to a great extent by means of pegs in substitution of shuttles, although shuttles are also used to some extent. Various accessory details are described as also a method of preparing the material ready for being manufactured, and dressing same for like purpose.

A.D. 1875, February 17.—No. 568.

GIRDWOOD, Henry Mercer, of Belfast, in the county of Antrim, in Ireland, spinner.—"Improve- "ments in spinning machinery."

The use of springs to act upon the bobbins, perns, or spools, and regulate the velocity thereof.

A.D. 1875, February 17.—No. 569.

KING, John Thomson, of Liverpool, in the county of Lancaster, patent agent.—(*A communication from George Westinghouse, junior, of Pittsburgh, Pennsylvania, in the United States of America.*)—"Improve- "ments in motive power engines."

This invention relates to automatic engines of the reciprocating class, that is to say, engines in which the steam or operating fluid is caused to actuate the reversing or equivalent valve employed for controlling the admission and emission of steam or elastic fluid to and from the cylinder, and consists—

First. In causing the reversing valve to be operated by the intermittent action of steam or elastic fluid on one part of the said valve, the pressure on the other parts being constant.

Second. As means for obtaining the intermittent action of the steam or other elastic fluid to the reversing valve, a valve, by preference a slide valve, actuated by the to and fro motion of the piston, is employed.

Third. In forming the reversing valve of three pistons of differential area on a stem.

A.D. 1875, February 17.—No. 570.

MYERS, Maurice, of the firm of M. Myers and Son, of Birmingham, in the county of Warwick, manufacturers.—"Improvements in metallic boxes for holding metallic pens, and other small "articles."

This invention consists in securely closing the hinged lids of the said boxes by means of an outer case or slide of the same figure as the box, but somewhat longer and larger. When the lid of the box

A.D. 1875, February 17.—No. 575.

HENSON, Henry Henson, of No. 27, Martin's Lane, Cannon Street, in the city of London.—"Improvements in paving for roads."

According to this invention wood pavement is made of blocks laid upon a foundation of bricks covered with planks, upon which a layer of felt served with pitch or asphalt is placed. The blocks have a similar layer of felt between them. They are keyed together by tongues fitting in grooves in their meeting sides, and their surface is formed with grooves to afford foot hold for the horses. Or every alternate row of blocks is made somewhat lower than those adjoining, and the grooves thus formed are filled in with asphalt. Instead of covering the entire surface of the road with wood, it is proposed to provide rows thereof lengthwise of the road at distances apart, corresponding to the distance of the carriage wheels, and the intermediate spaces are filled in with a grouting of asphalt and stones.

A.D. 1875, February 17.—No. 576.

HIRSCH, Joseph, of No. 27, Norfolk Street, Strand, in the county of Middlesex.—(*A communication from Max Hirsch, of Cologne, in the Empire of Germany.*)—"Improvements in screw propellers."

This invention relates to screw propellers, such as those described in the Specifications No. 2930 of 1860, and No. 17 of 1866.

According to the present improvements the propeller blade is made of such a form that a section through the same perpendicular to the axis of the propeller at the entering edge of the blade presents a line curving gently forwards from the root of the blade to its tip, while a similar section at the leaving edge presents a line, having a forward curvature considerably greater than that of the entering edge, and intermediate sections present curvatures of degrees intermediate between the two.

The increase of forward curvature is determined in such a manner that the blade has a pitch increasing from the front edge backwards, such increase of pitch being greatest at the tip.

A.D. 1875, February 17.—No. 577.

CORNISH, Hannah Matilda, of Reigate, in the county of Surrey.—(*A communication from Thomas Cornish, of Sandridge, in the Colony of Victoria.*)—"Improvements in mattresses, couches, seats, life buoys and other similar articles designed to serve for use at sea, and generally for preventing loss of life by drowning."

This invention has reference to mattresses, couches, seats, life buoys, and other similar articles intended for general use at sea or on the water, and designed to be immediately available for saving life in case of accidents by fire or shipwreck or other disasters.

The invention relates to a novel combination of materials constituting a thoroughly floatable and buoyant stuffing for mattresses, couches, seats, life buoys, and such like articles, whereby they are made to form also comfortable beds or seats, and a method of applying bands, straps, buckles, cordage and eyelet holes in such mattresses, couches, seats, or other articles whereby means are afforded for readily saving life and for the rapid construction of safe and commodious rafts capable of at any time supporting numbers of persons on the water.

The stuffing consists of a mixture of cork shavings, ground cork, or cork dust, with good clean pine or deal or other light wood shavings or dried bull rushes properly prepared and "teased" into a "fine fibre.

A.D. 1875, February 17.—No. 578.

BROWNE, Alexander, of the firm of Browne and Company, patent agents, of 5, Southampton Buildings, Holborn, in the county of Middlesex.—(*A communication from Addison Calvin Fletche engineer, of the city county and state of New York, United States of America.*)—"Improvements in the construction of screw propellers."

The features of novelty of this invention consist in making the blades of screw propellers hollow, and providing the same with openings for the induction and eduction of water at different parts of the blades. Also in certain arrangement of wall to ordinary propellers, so as to constitute the rear wall of a hollow blade.

A.D. 1875, February 17.—No. 579.

MANBRÉ, Alexander, of Baker Street, Portman Square, in the county of Middlesex, brewer and sugar manufacturer.—"An improved process and apparatus for treating vegetable substances for the "extraction of fatty matter, and for the manufacture of spirits and fermented liquids."

My improved process is for extracting the fatty matter contained in fruits, cereals, seeds, nuts, roots, and other vegetable substances containing fatty, starchy, or saccharine matters thereby freeing the starchy and saccharine matters from the fatty matter and rendering them more suitable for the production of purer and better flavoured spirit and wine, beer, and other fermented beverages.

A.D. 1875, February 17.—No. 580.

HOWAT, Andrew, of Manchester, in the county of Lancaster, machinist.—"An improved mode of "and apparatus for filling, closing, and drawing off the contents of bottles containing soda water and "other effervescing liquids."

The object of my invention is to facilitate the filling, closing, and drawing off the contents of bottles containing effervescing liquids, whereby a portion of the said contents can be drawn off without allowing the fixed gases to escape. My improved apparatus consists of a spindle with a plug below to open or close a hole in the bottom of the bottle. The spindle passes above through a stuffing box in the neck of the bottle.

A.D. 1875, February 17.—No. 581.

SALMON, James, of Manchester, in the county of Lancaster, printers' engineer, and **CROSLAND**, William, of the same place, machine maker.—"Improvements in machinery for grinding and polishing "lithographic and other stones."

Our improved machinery consists of a grinding disc which revolves rapidly on a vertical spindle, and of a frame with movable jaws by which the stone to be ground and polished is moved over the disc.

A.D. 1875, February 17.—No. 582.

GUDGEON, William, of Rochdale, in the county of Lancaster, manager.—"Improvements in "machinery for preparing cotton and other fibrous substances."

My invention is applicable to slubbing frames and other machines of the like nature in which cones are used for driving the bobbins; my improvements consist in a self acting apparatus for keeping the strap or straps passing around the said cones at a uniform state of tension; this is effected by pulleys in a swing frame, which pulleys act on the straps and the swing frame is moved by a cranked shaft to remove the pulleys from the straps.

A.D. 1875, February 18.—No. 583.

MARSHALL, Nathaniel, of the town and county of the town of Nottingham, machinist.—"Improvements in machinery and apparatus applicable to circular looped fabric machines for making fancy "hosiery."

The inventor forms vertical stripes on plain looped fabrics by employing a second loop wheel instead of a dividing wheel; both loop wheels are formed so as to make alternate series of slack loops and tight loops alternately and using two thread guides and two cutting blades in the second loop wheel and for forming vertical stripes on a ribbed looped fabric he employs a vertical cam to the frame needles which allows them to alternately draw a series of long loops and short loops, and outside the machine needle bits or jacks he places a presser wheel, and inside the machine head a cam having a sliding incline, between which and the presser wheel the machine needle bits pass and draw series of long and short loops.

A.D. 1875, February 18.—No. 584.

FREIR, Alexander, of Dundee, in the county of Forfar, North Britain.—"New or improved machinery or apparatus for distributing liquids in batching jute and other fibrous substances."

The feature of novelty which constitutes this invention is the arrangement and construction of the apparatus.

A.D. 1875, February 18.—No. 585.

ROBERTS, Thomas, of Clerkenwell, in the county of Middlesex.—"Improvements in the construction of ships."

This invention consists in forming one or more longitudinal divisions from stem to stern of the ship of such strength as to form girders sufficient to support the weight of the ship in all circumstances. Transverse divisions attached to the longitudinal girder divide the ship into compartments, which may be provided with moveable watertight doors. Drain pipes from the bottom of each compartment lead to a central tank, and the flow of water from any pipe shews leakage into its particular compartment. Indicators may be arranged so as to shew the influx of water. Ventilating pipes are also provided at the top of each compartment, their outer ends passing to an air shaft, and the issue of smoke from any pipe indicating fire in its compartment. Water service pipes are also provided at the top of each compartment, their outer ends leading to the engine room or other convenient place where the issue of smoke from any pipe will also indicate fire. These pipes may also be used to connect hose through which water may be pumped into the compartment. Between the ribs inside the outer plating of the ship, timber filling is used, fitted in cement and wedged tight by wedges, so that the inside of the ship presents a smooth continuous surface. The timber filling may be fastened by metal strips, and an inner lining of planking may be added laid in watertight cement.

A.D. 1875, February 18.—No. 586.

FAREN, Joseph, of Belfast, in the county of Antrim, in Ireland, flax spinner and merchant.—"Improvements in the process of scutching and preparing fibrous vegetable substances for manufacture, and in the machinery therefor."

The use of teeth or spikes set in close proximity and operating simultaneously with great velocity on both sides of the substances to be scutched and prepared.

A.D. 1875, February 18.—No. 587.

RUTHVEN, William, of Deptford, in the county of Kent.—"Improvements in fire lighters."

Three or four pieces of wood are halved together so as to form triangle or rectangle with projecting ends. One or more cross bars are placed in the centre.

A.D. 1875, February 18.—No. 588.

KENDALL, William John, of Heaton Norris, in the county of Lancaster, engineer, and **ROBINSON**, George Andrew, of Stockport, in the county of Chester, accountant.—"Improvements in the construction of castors."

The castor is formed in two main parts or portions. The upper part of it consists of a plate circular by preference, and either fastened directly to a piece of furniture or provided with a socket in which the lower part of a leg of a piece of furniture enters. The lower part of the castor consists of a circular plate similar to that of the top portion, on which plate is formed or fastened a bracket to hold the well known ground roller. Between the circular plates of the upper and lower parts of the castor a suitable number of small balls or rollers are placed running in circular grooves. The top and bottom portion of the castor are held together by a centre screw.

A.D. 1875, February 18.—No. 589.

AVERY, Henry George, of No. 28, Clifton Road, Downes Park Road, Hackney, in the county of Middlesex, corset and busk and bodice fastening manufacturer.—"An improvement in ladies' dress suspenders."

The use of knots in the elastic cord or braid or other suspending material held fast by clasps made with clips.

A.D. 1875, February 18.—No. 590.

PEACOCK, John Chapman, of 14, Queen Square, Bloomsbury, and **RUDKIN**, Thomas, of the Griffin Tavern, Meat Market, Smithfield.—"Improvements in apparatus for cooking and boiling by means of gas."

This Provisional Specification describes improvements in the oven described in the Specification of the Patent No. 1065/74. Improvements in gas gridirons are also described, also in apparatus for boiling, either to obtain hot water or steam for cooking. Other improvements in cooking apparatus are also described.

of these clips, slides or fastenings are connected together at suitable distances apart by a cord or chain, one end of which is attached to the lower end of the opening of a boot or shoe, the other end being secured when the opening is closed, by passing over hooks, studs, or other contrivances arranged on each side of the top parts of the opening.

According to part of these improvements such clips, slides, or fastenings, are made from sheet metal which is sunk or pressed into form by means of male and female dies and closing or shaping tools, some of which are similar to those employed for making metal buttons from discs of sheet metal.

According to another part of the improvements, clips, slides, or fastenings of this description are cast of malleable metal with a core in such manner that the sides or parts forming the clip can be turned over after being cast.

A.D. 1875, February 18.—No. 596.

WHITEHOUSE, Walter, of Pimlico, in the city of Westminster, surgeon-dentist.—" Improved means " for sustaining artificial teeth in the mouth."

The invention consists in the employment of a flexible disc or diaphragm of prepared vulcanite applied in a mount or base for artificial teeth in such manner that when placed in the mouth the air may be expelled from the space between the latter and the mount by pressing the disc against the roof of the mouth to expel the air and create a partial vacuum, which sustains the mount without the aid of wires, clasps, or springs.

A.D. 1875, February 18.—No. 597.

SINCLAIR, James, of the city of Manchester, merchant.—" Improvements in face-shields for " respiring in noxious atmospheres."

The features of novelty in this invention which refers to that class of face piece to which a filtering apparatus is applied filled with layers of cotton, wool, charcoal, quicklime, or other absorbents of carbonic acid consists in dispensing with the usual metallic mouth piece and tubular water pads and in attaching the mouth piece to a face piece formed of vulcanised sheet india-rubber so shaped and sufficiently elastic to adapt itself to the face of the wearer, and in the upper part of which elastic face piece glass eye pieces or goggles are mounted.

A.D. 1875, February 18.—No. 598.

ROGERS, John, of Scropton Street, Rochdale Road, in the city of Manchester, engineer.—" Improve- " ments in the construction of water columns for railway purposes."

My invention consists in the use of a pendulum socket and pipe which is connected by a water tight swivel joint to the column; the feed valve is adapted to the stationary part of the head of the column and is worked from the top of the tender by a lever with pinion and rack or other equivalent. I place a lamp at the top of the water column. The pendulum pipe and valve may be connected to a water supply pipe carried over head on a bridge or otherwise, thereby dispensing with the column.

A.D. 1875, February 18.—No. 599.

LIVESEY, James, of 9, Victoria Chambers, Westminster, in the county of Middlesex, engineer.— " Improvements in the permanent way of railways and tramways, and paving for the same."

1. Improved foundation for, and new method of setting the pavement and sleepers of tramways to prevent sinking, and to preserve both at the same level.
2. Provision for lowering tramway rails to accommodate them to the more rapid wear of the adjoining stones.
3. Fishing grooved tramway rails to make an improved rail joint.
4. Method of laying timber pavement to prevent any one block sinking below the other, specially applicable to tramways.
5. Corrugations in wrought iron or steel jaw and cast iron key for railway chairs.

A.D. 1875, February 18.—No. 600.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from George Henry Felt, of the city and state of New York, United States of America.*)—" Improvements in ordnance."

A.D. 1875, February 19.—No. 605.

WHITBURN, Thomas, of Guildford, in the county of Surrey, artist.—"Improvements in producing designs, patterns, and devices upon wood by printing, in apparatus employed therein, and in the preparation of the inks or colors for the purpose."

This Provisional Specification describes a mode of printing designs, &c., on wood by means of a printing press; a special preparation of inks or colors for the purpose, and an addition to the press to enable the printing to be conveniently effected in particular cases.

A.D. 1875, February 19.—No. 606.

LILLIE, Joseph, of Manchester, in the county of Lancaster, engineer.—"Improvements in kitchen ranges and in apparatus for heating."

I make the oven of terra cotta, fire clay, or other earthy substances of square, circular, octagonal, or other convenient shape; the oven is surrounded by a flue which separates it from the boiler; the flue is separated into divisions by partitions, and the products of combustion from the fire grate which is placed below pass to and fro through the divisions of the flue.

Another part of my invention consists in the application of cast steel for making the boilers of kitchen ranges and heating apparatus.

A.D. 1875, February 19.—No. 607.

TAYLOR, James, of 19, Salisbury Street, Strand, London, 3, York Buildings, Dale Street, Liverpool, and Birkenhead, engineer.—"Improvements in furnaces, and the fire bars and other parts thereof."

A novel construction and arrangement of furnaces in which hollow furnace bars are employed in two sets or series at different levels, but connected together at their back ends by means of tube or other connections, or to and with angularly cored passages by which the circulation of water is effected between the lower and upper series of bars, whilst the front ends are connected with separate hollow bearers or a double cored bearer having a horizontal web or division separating the entering and cooler feed water from the hotter and discharge water.

A.D. 1875, February 19.—No. 608.

THACKRAH, William, of the firm of Thackrah and Company, of Dewsbury, in the county of York, woollen manufacturers.—"A new process for bronzing or giving a metallic appearance to textile fabrics."

The novelty of the invention consists in producing upon piled fabrics which have been previously dyed, a bronzed or metallic appearance by chemical agency, (viz.) subjecting such fabrics to various baths composed of tannic acid, picric acid, and then a solution of nitrate of tin and muriate of copper. Finally the fabrics are boiled in a solution of analine.

A.D. 1875, February 19.—No. 609.

ASTON, Arthur John, of Birmingham, in the county of Warwick, button manufacturer.—"Improvements in solitaires and studs and other similar dress fastenings."

This invention consists of the following improvements in connecting and disconnecting the detachable parts of solitaires, studs, and other dress fastenings.

The central stem on the back of the front disc of the stud is wedge shaped, and has on its opposite sides transverse grooves or corrugations, and in the hollow stem or shank on the back disc of the stud is a forked spring having transverse grooves or depressions therein, corresponding to those on the wedge shaped stem. When the wedge shaped stem on one part of the fastening is inserted and pushed home in the hollow stem or shank of the other part of the fastening, the forked spring is forced open, and its arms made to close or snap upon the wedge shaped stem and hold it securely.

By the application of considerable force the wedge shaped stem may be withdrawn from the hollow stem or shank, and the two parts of the fastening separated.

A.D. 1875, February 19.—No. 610.

STOKES, William Henry, of Birmingham, in the county of Warwick, manufacturing jeweller.—"Improvements in apparatus for signalling on railway trains."

A.D. 1875, February 19.—No. 615.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Guillaume Boivin, of Montreal, Canada, manufacturer.*) —" An improved method of cutting leather or other like substances to be used for boot or shoe " stiffeners."

This invention consists in leaving projecting ears in part of the stiffener, in leaving a recess or deflection in the upper part, in leaving one or more points in the lower portion, in cutting the ends of the stiffeners in curves or straight lines, and in combining all the different forms given to the stiffeners.

A.D. 1875, February 19.—No. 616.

BURLING, Edward Thomas, of Goswell Road, in the county of Middlesex.—" Improvements in the " construction of piano-fortes."

The improvements have for object to obtain greater accuracy and facility in tuning, by bringing the tension of the strings to bear directly on the ends of the bars or bracings of the frame, thereby avoiding the deflecting strain consequent on attaching the strings to pins projecting from the wrest plank, the frame also being less subject to strains. To enable persons to tune their own instruments a series of metal tongues tuned to the required scale are placed opposite their respective notes which can be tuned in unison with them.

A.D. 1875, February 19.—No. 617.

SCOTT, Robert, of No, 8, Cromwell Street, Nottingham.—" Improvements in fabrics produced in " twist lace machines."

This Provisional Specification describes first a method of ornamenting a muslin like ground, and second a method of producing open work or holes in the midst of the muslin, such holes having a thickened and raised margin as if worked with the needle.

A.D. 1875, February 20.—No. 618.

SCHWANCK, Charles Frederick, of the city of London, engineer.—"A new or improved elastic " spring hook or fastening adapted for the traces of horses, couplings of railway carriages, and other " useful purposes."

The Specification of this invention describes a hook or fastening with a spring action in the direction of the strain upon it, and with opening jaws so locked by a link on their exterior surfaces reacted against by a spring between the jaws as enables the jaws to be opened easily and quickly even whilst great strain may be on the hook.

A.D. 1875, February 20.—No. 619.

KOTTGEN, Adolph, of 39, Old Broad Street, in the city of London.—(*A communication from Adolph Gauhe, of Barmen and Eitorf, in Prussia, in the province of Rhenish Prussia.*)—" Improvements in the " manufacture of colouring matter suitable for dyeing and printing."

The process consists in heating the substance known to chemists under the name of " anthracene " with concentrated or fuming sulphuric acid to a temperature from between 240 to 260 degrees centigrade until, in diluting a small portion of it with water, no more precipitate is produced. The "anthracene" used should be as pure as possible, because the purer the "anthracene" the less sulphuric acid is required for its perfect solution. The quantity of sulphuric acid varies if the ordinary concentrated acid is used, from between 10 to 20 parts of the weight of "anthracene" used, if fuming acid be employed, from between 3 to 10 parts of the weight of " anthracene."

The resulting liquid has to be dissolved in about 15 to 20 times of its volume of water and neutralized with caustic lime or carbonate of lime. After filtration the liquid, which contains now the lime salts of what I call the sulfo-acids of anthracene, is precipitated with carbonate of soda.

The soda salts of the above sulfo-acids received in this way are heated with 2 to 3 times their weight of caustic soda or potash, or a mixture of both, in a suitable vessel to a temperature from between 180 to 260 centigrade until in dissolving a portion of the fused mass in boiling water the colour ceases to become more intense.

A.D. 1875, February 20.—No. 626.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Jacques Viglino, engineer, and Jacques Donna, solicitor, both of Turin, Italy.*)—" Improvements in motive " power engines."

This invention describes a cylinder or drum fitted with a shaft and inclined vanes, and communicating with cylinders below in a furnace; the vessels are charged with water, and on the application of heat below, the steam generated rises and fills the vanes on one side only of the drum, which steam, conjointly with the water on the vanes situated on the other side of the drum, imparts a rotary motion to the same.

A.D. 1875, February 20.—No. 627.

LYTTLE, William Alexander, of the Grove, Hammersmith, in the county of Middlesex, civil engineer. —" Improvements in the means and apparatus for manufacturing alkali, which improvements are " partly applicable to other purposes."

The features of novelty are:—

Firstly.—The reduction of sulphate of sodium or barium to sulphide of these metals, by subjecting either of the sulphates to the flame of a blast furnace, described in the Specification of my Letters Patent, numbered 2984, and entitled, " Improvements in the manufacture of iron and steel," the sulphate employed being incorporated in a powdered state with carbonaceous matter and clay, and worked into lumps in the same manner and for the purpose of being subjected to the same furnace treatment as is directed to be applied to powdered iron ore in the aforesaid patent.

Secondly.—The addition of ferric oxide to either of the aforesaid mixtures of sulphate of barium or sodium, in order to produce by the same furnace treatment, the oxides of barium or sodium, according to the metallic salt employed.

Thirdly.—The removal of the sulphur from the sulphides produced as above, by ignition or boiling in water with the powdered oxide of any metal having a stronger affinity than sodium or barium for sulphur.

Fourthly.—The addition of reduced metallic iron or copper to the mixture referred to in the above first clause, to aid in the reduction of the sulphates to oxides of barium or sodium.

Fifthly.—The incorporation, consolidation into lumps, and furnace treatment, all as described above, of a mixture of ferric or cupric sulphide, sodic chloride, and carbonaceous matter, with an oxidating blast in the furnace mixed with steam as the means of recovering the sulphur taken up by the iron or copper in the above process, by forming sulphate of sodium.

A.D. 1875, February 20.—No. 628.

BUCHANAN, Thomas Ryburn, of All Souls College, Oxford, in the same county.—(*A communication from Henry Alexander Studwell, of Brooklyn, state of New York, United States of America.*)—" Improved " means and apparatus for economizing fuel and generating heat in steam boilers."

This Provisional Specification describes a deflector, consisting of a strip of sheet metal twisted spirally somewhat like an auger of the proper diameter, to be slipped loosely into a cylindrical boiler flue and serve to divide the same into two spiral passages, so that the flame or heated gases will act equally upon the entire inner surface of the flue.

A.D. 1875, February 20.—No. 629.

SINCLAIR, James, of Ripley, in the county of York, gardener, and, **CLAYTON**, Arthur, of the same place, plumber.—" Improvements in sweeping and rolling machines."

By the forward movement of this machine the brush will be caused to rotate and throw away leaves or other light matters into a box, after which the grass is rolled by a roller attached to the back of the machine.

A.D. 1875, February 20.—No. 630.

ROOD, George Albert, of Bridport, in the county of Dorset, manufacturer, and, **HALLETT**, Barnard, of the same place, cutler.—" Improvements in bicyles."

This Provisional Specification describes a means of constructing bicycles by which men of different heights may use the same machine, merely by shifting the position of the treadle blocks or steps.

A.D. 1875, February 20.—No. 631.

WOLSTENCROFT, Edward, of Blakeley, near Manchester, in the county of Lancaster, engineer.—"Improvements in self acting temples for looms."

My invention consists, First, in the use of two conical rollers over which the selvage of the cloth passes and of a third conical roller, covered by preference with vulcanite or gutta percha which is pressed down on to the cloth by a regulating screw. Secondly, in the use of two or more spiked discs, each loose on a stud fixed in a box; the selvages are held by the spikes. Thirdly, in the use of two or more rollers with annular grooves between which the selvages of the cloth are secured.

A.D. 1875, February 20.—No. 632.

CASWELL, Samuel, of Euston Square, in the county of Middlesex.—"A self acting railway "brake."

This invention has for its object the production of a self-acting brake which falls into action by its own gravity upon a weighted lever being released by the driver of the train; or in the event of any part of the train becoming detached, the brake action is instantaneously applied to such detached portion.

A.D. 1875, February 20.—No. 633.

NAPIER, William Donald, M.R.C.S., of George Street, Hanover Square, in the county of Middlesex. —"Improvements in tooth and flesh brushes or rubbers."

This Provisional Specification refers to brushes formed of vulcanised india rubber and describes combining with the india rubber a sharp polishing powder such for example as powdered cuttle fish bone so as to give it a more frictional surface.

A.D. 1875, February 20.—No. 634.

SMITH, James Henry, of Albion Works, Lansdowne Road, London Fields, in the county of Middlesex. —"Improvements in sewing machines."

This invention relates to improvements in the presser, take-up, shuttle and its carriage, feed and loop catch of lock stitch sewing machines, and an adjustable automatic embroidery designer for use either in lock stitch, chain stitch, and other sewing machines. The presser is held down by a flat blade spring; the take up is effected by a lever worked by a cam; the shuttle is provided with a spring hook for taking up slack of the under thread, and its carriage is fitted with a lever for holding down the shuttle or for throwing it up by hand, the said lever operating as a retarder of the loop passing over the shuttle when the machine is used for chain stitch. The four motion feed is worked by a vertical and a horizontal lever jointed together, the vertical lever being moved by a crank and having a fulcrum that can be shifted to vary the feed. A loop catch is provided to enter the bulge of the needle thread in front of the shuttle, rendering a pause of the needle unnecessary. An adjustable designer is provided consisting of two arms or springs with points, which are made alternately to enter into holes in the cloth plate on each side of the presser foot, which points form pivots for the work to turn upon; both points are capable of being lifted clear and the work proceeded with straight forward; a guide is provided for indicating the distances to be traversed.

A.D. 1875, February 20.—No. 635.

TILLEY, William, of Stafford, photographer.—"Improvements in photographic processes, and in "apparatus to be used in connection with the said improvements."

This invention consists in producing combination photographs and photographic enlargements in the following manner:—

In producing a combination photograph, that is a portrait or object in combination with any required background, a portrait of the sitter is taken, having a dark background. The sitter is then masked by means of curtains and a white background placed behind him. A positive background is next placed near to the sensitive plate. The light from the white background is thrown upon the positive background and passes through it on to the sensitive surface. A negative impression of the background is thus produced around the image of the sitter. The background photograph is carried in a frame jointed to the dark slide or to the camera. By means of the said frame the background photograph may either be placed parallel with the sensitive plate or turned from the said plate.

For enlargements and for combination printing without enlargements a separate mask and negatives are used. The portrait with a white background is taken on one plate and a mask on another plate. A reverse mask is taken from this mask, the said reverse mask having a transparent background, and the portrait and mask are fixed to the parts or sides of a double or hinged dark slide. The mask is carried by an adjustable carrier.

The dark slide having been fixed in front of the enlarging lens, the side of the slide containing the mask is turned down, while that carrying the portrait negative is copied on an enlarged scale on the sensitive surface. The other part of the slide carrying the mask being raised, and that carrying the portrait being depressed, a photographic background is placed nearly in contact with the sensitive surface, and the mask being illuminated the light passes through the superposed background, and the latter is printed, the mask preventing any printing upon the portrait already impressed on the plate The portrait and mask may be used for combination printing without enlargements.

A.D. 1875, February 20.—No. 636.

ROBERTS, George, of Birmingham, in the county of Warwick, pianoforte manufacturer, and **ROBERTS, Alfred**, of Birmingham, aforesaid, pianoforte manufacturer.—"Improvements in cottage "and other upright pianofortes."

According to this invention the jack or lever is attached, by a joint or centre on which it turns, to the rear end of the key, so that on the removal of the key the jack or lever is brought away with it. The jacks or levers work in a horizontal rack bar over the rear ends of the keys and the escapement is effected by a regulating screw passing through the back and lower part of the jack bearing against a fixed upright on the key in conjunction with a regulating arm in front of the jack and an adjustable button on a rail in front of the rack bar. By means of the mechanism described improved musical qualities are obtained in the pianoforte as well as great mechanical advantages. The removal of a key brings with it the jack or lever; the removal of the action frame brings away the hammers, dampers, and parts connected therewith; while the rack and escapement button rail may be separately removed.

A.D. 1875, February 20.—No. 637.

WIRTH, Frank, of the firm of Wirth and Company, Patent Agency, of Frankfort on the Main, in the Empire of Germany.—(*A communication from Josef Wertheim, manufacturer, of Frankfort on the Main, in the Empire of Germany.*)—"Improvements in ship furnitures for preventing the bad influences "of the vacillations of the ship at sea."

This invention relates to a movable seat or bed in connection with a weight and socket joint or ring for preventing the effects of the motion of ships at sea.

A.D. 1875, February 20.—No. 638.

IBBOTSON, Horatio Walter, of Sheffield, in the county of York, gentleman.—(*A communication from Thomas Holt, of Trieste, Austria.*)—"Improvements in grate bars for furnaces or fire places."

The object of my invention is the construction of the bed of a furnace in such a manner that the largest possible quantity of air may be admitted to the fuel without leaving any spaces in the grate bars large enough to permit more than the smallest if any particles of the fuel to fall through or between them unconsumed.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

ridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 14 to August 20, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, February 22.—No. 640.

RRALL, Samuel, of Dundee, in the county of Forfar, North Britain.—"A new or improved achine for drawing card pins."

he feature of novelty which constitutes this invention is—

irst. The arrangement and construction of the mechanism.

cond. The conical spindles or rollers with fluted or roughened surfaces.

A.D. 1875, February 22.—No. 642.

, William, of Lochee, in the county of Forfar, North Britain.—"Improvements in compressing arn."

he feature of novelty which constitutes this invention is the compressing of yarn for the purpose forth and the means for effecting the same.

A.D. 1875, February 22.—No. 649.

WLEY, Samuel Hunt, of Swadlincote, in the county of Derby, earthenware manufacturer.—"Improvements in water closets."

his invention refers to those closets which have an outlet pipe at the side of the basin, and in ch a certain amount of water remains at the bottom of the basin, not to form a seal, but to receive soil. The Provisional Specification describes admitting the whole or the greater part of the hing water to the basin at a point diametrically opposite the outlet, so as to ensure that the tents of the basin are carried off.

A.D. 1875, February 23.—No. 664.

RFIELD, William, of Birmingham, in the county of Warwick, manufacturer.—"Improvements n the manufacture of metallic handles for tea and coffee pots, jugs, and other vessels and articles."

his invention consists in making metallic handles of two longitudinal half handles, and a lining trengthening piece between them. The lining piece has the general figure of one of the half dles, but is of less size. In putting the parts of the handle together, the lining piece is placed in of the half handles with its convex side outwards and soldered thereto. The second half handle is n placed edge to edge upon the prepared half handle and upon the lining piece, and the parts soled together, the solder running between the lining piece and the abutting edges of the half handles.

A.D. 1875, February 24.—No. 675.

NRIOT, François Paul, of Saint Dizier, (France), printer.—"An improved apparatus for indicating vater-level in vertical boilers or other boilers."

his invention consists in constructing a water gauge for a boiler with a vessel containing a float a wire extending from the float down a small pipe fitted with a glass tube, the wire being made h a mark on it which shews through the glass the level of the float and consequently that of the l in the boiler. The wire also carries a valve which in case of the glass breaking, automatically es the pipe against escape. Instead of using a glass a thin copper pipe may be employed, the wire inside having on it a piece of iron or magnet, and an iron ring or magnet index being fitted to slide freely outside the pipe, the outer ring or index following the movements of the piece inside. By turning up the water pipe of the float vessel and placing the float in the turned up portion, the pipe below may be kept free from water.

A.D. 1875, February 24.—No. 678.

WIRTH, Frank, of the firm of Wirth and Company, patent-agency, of Frankfort on the Main, in the Empire of Germany.—(*A communication from William Knaust, manufacturer, a person resident at Vienna, in the Empire of Austria.*)—" Improvements in stop-valves."

The said invention consists, first, in a closing arrangement in combination with two conical pieces, the surfaces of which are parts of a circular cone or of any other rotating body. Second, in the pressing of the said conical pieces in their seats by means of a wedge which only follows the upward and downward movement of a vertical spindle but not the rotating movement of the latter.

A.D. 1875, February 25.—No. 693.

STORER, John, of Birmingham, in the county of Warwick, mechanical engineer.—(*A communication from William S. Cooper, of Philadelphia, in the United States of America.*)—" Improvements in water " closets."

According to this invention the water supply cock is opened and closed by a weighted lever actuated by a second weighted lever, which latter lever works the tilting pan of the basin to which pan it is connected by a slotted arm and pin. The weight of the tilting pan lever serves to couple the said lever to the hand rod by the lifting of which the mechanism is brought into action. The combined weight and coupling is capable of being adjusted on the end of the tilting pan lever both vertically and horizontally, and the hand rod is coupled to the said weight by a kind of ball and socket joint which permits the weight to turn freely on the lever without obstruction to the proper working of the other parts of the mechanism.

A.D. 1875, February 25.—No. 703.

CAITHNESS, The Right Honorable, James, Earl of, of Portland Place, in the county of Middlesex.— " Improvements in cleaning railway rolling stock, vehicles, and vessels, and in the machinery or " apparatus employed therein."

This invention relates to a mechanical arrangement for washing and if necessary drying or wiping railway carriages or other rolling stock of railways, whereby the costly hand labor at present required for cleaning carriages is almost entirely dispensed with, and it is also applicable to the cleaning of other vehicles such for example as tram cars, and also for cleaning ship's bottoms.

A.D. 1875, February 26.—No. 707.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Victor Guérin, of Paris, France.*)—" Improved apparatus for enlarging and " reducing designs, prints, and other delineations."

The apparatus consists of a circular sheet of india rubber on which the design is impressed, held in a frame and drawn over a fixed disc by a nut caused to travel up and down a screw pillar by means of a hand wheel.

A.D. 1875, February 27.—No. 730.

CURRALL, John, of Birmingham, in the county of Warwick, manager of works.—" Improvements " in apparatus to be applied to windows, doors, walls, and roofs, for ventilating rooms and buildings."

This invention consists of arrangements of openings either in the window sashes or sash frame, which openings by the positions of the sashes are covered or uncovered, and the ingress of fresh air and the egress of vitiated air permitted or prevented at pleasure. Also applying similar arrangements to doors in combination with sliding or hinged plates for covering or uncovering the air openings. Also adapting to ceilings and roofs an arrangement for permitting of the escape of vitiated air at the ridge tiles; and further, an arrangement of ventilator for chimneys or flues and walls, in which the exit passage is small compared with the entrance passage.

the sulphurets or the oxides, or with other natural or artificially produced insoluble compounds of copper may in a fine state of division be employed in lieu thereof or in conjunction with the soluble salts of copper before referred to.

The apparatus in which the mixtures as described may be used in combination with a separate source of hydrochloric acid may be a column or tower, or a number of columns or towers connected together, and made of iron or brickwork or both as more fully described in the Specification of a Patent granted to me on the 13 September, 1870, No. 2469.

During the manufacture of chlorine by this invention, chloride of copper is volatilized, and it is by this invention obtained in a dry state from the gases issuing from the apparatus by passing them through a suitable column or tower made of stone or other suitable material and partly filled with pieces of burnt clay or other similar material, the whole arrangement acting as a "scrubber" of the gases, and being kept at any temperature between that at which aqueous hydrochloric acid gas condenses, and that at which chloride of copper sublimes, say about between 300 degrees Fahrenheit and 600 degrees Fahrenheit. The chloride of copper condenses in this apparatus in a state much like wool, and may be removed from time to time, and utilized, and this method of separating chloride of copper from gases containing it may be employed whenever these gases containing it are obtained in the manufacture of chlorine by any other process than the process described herein.

A.D. 1875, August 17.—No. 2897.

SAUVÉE, Albert, of 22, Parliament Street, in the county of Middlesex, civil engineer.—(*A communication from Marie Joseph François Regis Faure and Jacques Louis Kessler, both of Clermont Ferrand, in the Republic of France.*)—"Improvements in the construction of apparatuses for the concentration of "sulphuric acid."

The first part of this invention consists in the mode of making the joint between the metal of which the boiler or heated pan is made and the metal or material of the cover used for condensing or carrying away the vapours which are formed.

The second part consists in various improvements in the construction of the refrigerators for cooling the concentrated sulphuric acid after it has left the still or pan.

A.D. 1875, August 18.—No. 2903.

IMRAY, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—(*A communication from Ignatius Hahn, of Pittsburgh, Pennsylvania, in the United States of America.*)—"Improvements in rolling mills."

This invention consists in an arrangement of five high rolling mill, wherein the inner working rolls are supported by strong outer rolls, which are trussed to give greater strength, the support and adjustment of the rolls being effected by hydraulic pressure; and means are described of driving the several rolls by belting so arranged as to tighten itself notwithstanding displacement of the rolls.

A.D. 1875, August 20.—No. 2934.

DIXWELL, George Basil, of the state of Massachusetts, of the Republic of the United States of America.—"New and useful improvements in steam engines."

This Complete Specification describes—

First. The combination with a steam engine cylinder of means of heating air, and so applying it to such cylinder to heat it as to keep from time to time its inner surface at a temperature sufficient to repel the mist created in the cylinder by introduction of the steam.

Second. The combination with the steam engine cylinder, or with such and its piston, or with the means or devices for heating the cylinder, so as to render its inner surface repellant of mist, of heat non conductors applied to the piston head and to the ends of the cylinder.

Third. The combination with the steam engine cylinder and its hot air jacket or means of heating the cylinder to render it repellant of mist, a thermometer and an electrical alarm apparatus, to indicate the extremes of temperature to be maintained in the cylinder to prevent mist generating therein, by or through condensation of the steam.

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 35 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 8 with the weekly Nos. of the Index for the present year.]

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Anderson, G., 2843, Aug. 12 (*App.* 7.) Gas; supplying gas.
Ankers, J., 2593, July 21 (*App.* 4.) Lubricating axles.
Antisell, T. M., & Bruce, De V., 2016, June 16 (*App.* 49.)
[Vapor and gas-engines.
Armstrong, J., 142, Jan. 14, Railway switches.
Arnold, L., & Kidd, J., 66, Jan. 7, Gas.
Arnold, W., 593, Feb. 18, Metal wheels.
Aspinwall, E. O., 249, Jan. 22, Candle and lamp wicks.
Aston, A. J., 609, Feb. 18, Solitaires, studs, &c.
Atherton, J., 396, Feb. 3, Pipe joints, &c.
Atkin, R., 92, Jan. 11, Life-boats, rafts, &c.
Atkins, J., 666, Feb. 23 (*App.* 7.) Metallic bedsteads
[and cots.
—— J., & Torr, C. W., 594, Feb. 18, Gasaliers, chandeliers, &c.
—— T., 527, Feb. 12, Ventilating.
Aubertin, E., Boblique, L., Leplay, H., & Box, J., 181,
[Jan. 16, Phosphates and phosphorus.
—— E., Boblique, L., Leplay, H., & Box, J., 214,
[Jan. 20, Disinfecting sewage, &c.
Avery, H. G., 589, Feb. 18, Dress suspenders.
Aylesbury, H., 262, Jan. 23, Bottle stoppers.
Ayton, P. E., 84, Jan. 9, Attaching knobs to spindles.

B.

Badcock, J., 280, Jan. 25, Ladies' dress improver.
Baffoy, P. H., Dupré, P. S. E., Rogé, H. N., & Poret, E.
(Clark), 288, Jan. 25, Preserving woven fabrics.
Bailes, R., & Hallsworth, S., 573, Feb. 17, Treating sewage.
Bailey, W. H., 539, Feb. 13, Steam-boiler fittings.
Baillie, R., & Westwood, J., 341, Jan. 29, Corrugated
[iron plates.
Baird, J., & Brown, J. F., 258, Jan. 23, Weaving.
Bairnsfather, S., 613, Feb. 19, Signalling on railways.
Baker, D., 1577, Apr. 29 (*App.* 44.) Mariners' compasses.
—— J. M. B., 86, Jan. 9, Drying steam-boilers.
—— R., 62, Jan. 7, Jacquards.
—— W., 327, Jan. 28, Purifying iron.
Balestrieri, P. (Clark), 89, Jan. 9, Collecting rays of
[light and heat.
Ball, C. J., & Richardson, J., 564, Feb. 16, Combined
[engine, &c., and air compressor.
Bannister, R. D., & Milligan, S. (Lake), 2245, June 18
[(*App.* 51.) Device for advertising.
Bañolas, R. (Johnson), 138, Jan. 13, Extinguishing fires.
Barker, A. (Alexander), 1633, May 3 (*App.* 45.) Railway
[breaks.
Barker, J., 432, Feb. 5, Hoists or cranes.
Barlow, H. B. (*Stratton*), 407, Feb. 3, Indicating water-
[level, &c.
Barron, W. S., & Britten, F. J., 118, Jan. 12, Centrifugal
[apparatus.
Bates, F. L. (Clark), 1639, May 3 (*App.* 45.) Locking
[screw nuts.
Bath, J., 369, Feb. 1, Coupling railway carriages.
Battersby, J., & Wilson, W., 375, Feb. 2, Cutting and
[pulping roots.
Baumotte, H. (Jensen), 494, Feb. 10, Painters' easels.
Bayliss, M., & Jones, E., 174, Jan. 16, Nuts and washers.
Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Beck, J., & Blakeborough, R., 227, Jan. 20, Hydrants
[and fire cocks.
—— W. H. (*Steinbach & Co.*), 394, Feb. 3, Saddle girths.
Beldam, W. A., Allibon, G., & Manbré, A., 264, Jan. 23,
[Steam boilers.
Bell, J. M., 565, Feb. 16, Stands for holding books, &c.
Bennett, F. G., 168, Jan. 15, Roller skates.
Benson, M. (*Redheffer*), 388, Feb. 3, Freezing, churn-
[ing, &c.
—— M. (*Williams*), 437, Feb. 5, Boots and lasts.
—— M. (*Wicks*), 1139, Mar. 30 (*App.* 7.) Looms.

Benson, M. (*Wicks*), 1199, Apr. 2 (*App.* 40.) Pattern
[chains for looms.
Benwell, R., & Humphreys, G. (Alexander), 196, Jan. 19,
[Bale bands.
Bewsher, J., 339, Jan. 28, Printing.
Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.)
[Burning bricks, &c.
Binns, L., 335, Jan. 28, Mounting driving bands of
[machinery.
Bishop, G. (*Knip*), 403, Feb. 3, Exhibiting pictures.
Blain, J., 278, Jan. 25, Fire extinguisher.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Blake, L. R., & Gardner, C. F., 206, Jan. 19, Boots
[and shoes.
Blakeborough, R., & Beck, J., 227, Jan. 21, Hydrants
[and fire-cocks
Blot, A. (Vaughan), 37, Jan. 4, Presses.
Bluck, E., 72, Jan. 8, Railway carriages.
Boblique, L., Leplay, H., Box, J., & Aubertin, E., 181,
[Jan. 16, Phosphates and phosphorus.
——— L., Leplay, H., Box, J., & Aubertin, E., 214,
[Jan. 20, Disinfecting sewage, &c.
Boggett, W., 526, Feb. 12, Ornamental designs, &c.
Bogle, A. (Lake), 395, Feb. 3, Brushing boots and shoes;
[polishing, &c.
Bohlken, A. (Jensen), 295, Jan. 26, Washing machine.
——— *A.* (Jensen), 307, Jan. 27, Earth-boring augers.
Bois, A., 45, Jan. 5, Safety guard for tram-cars, &c.
Boivin, G. (Lake), 615, Feb. 19, Cutting leather, &c.
Bonnefond, A., 46, Jan. 5, Water meters.
Bonner, J., 11, Jan. 1, Weaving.
Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
——— H.A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
——— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro-
[magnetic telegraphs.
——— H. A. (*Richards*), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Bontemps, P. (Clark), 99, Jan. 11, Hydrostatic motor.
Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.)
[Sewing machines.
Borchart, H. (Newton), 385, Feb. 2, Bullet patching
[machinery.
Boucley, P., 451, Feb. 6, Straps, bands, &c.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27, Railway signalling.
——— M. P. W., 96, Jan. 11, Hot gas & steam engines.
——— M. P. W., 574, Feb. 17, Fluid engines.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
——— G. T. (*Société Anonyme du Cuivre Français*),
[2042, June 3 (*App.* 49.) Protosulphuret of
[iron and sulphuretted hydrogen gas.
——— G.T. (*Société Anonyme du Cuivre Français*),
[2084, June 5 (*App.* 50.) Kilns or ovens.
——— G. T. (*Kohrig & Pzillas*), 2486, July 10
[(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, har-
[ness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181,
[Jan. 16, Phosphates and phosphorus.
——— J., Aubertin, E., Boblique, L., & Leplay, H., 214,
[Jan. 20, Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro-
[magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish-
[ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9,
[Filling and corking bottles.
Bradley, C., & Campbell, J., 480, Feb. 9, Combing fibres.
——— G., & Madderson, T., 63, Jan. 7, Crushing
[stones, &c.
Bradley, J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining
[powder.
Briebach, J. A., 313, Jan. 27, Indicating position of
[rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
——— J., F. W. & W. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
——— W. W., J. & F. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal
[apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Broadfoot, J., 507, Feb. 11, Waterclosets.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P.,
[76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking
[apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, H., 475, Feb. 9, Inkstands.
——— H., 476. Feb. 9, Call or signal bell apparatus.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing
[electro-type shells.
Brown, J., 549, Feb. 15, Confectionery.
——— J., 714, Feb. 26 (*App.* 6.) Copper plates for
[printing, &c.
——— J. F., & Baird, J., 258, Jan. 23, Weaving.
——— J. W., & Allan, G., 525, Feb. 12, Electric telegraphs.
——— M. H., 352, Jan. 30, Fire guards.
——— N., 538, Feb. 13, Weighing-machines.
——— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and
[windows.
——— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
——— W. Morgan- (*Donna & Viglino*), 626, Feb. 20,
[Motive-power engines.
——— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
——— W. Morgan- (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of type.
——— W. Morgan- (*Johnson & Harding*), 2250, June 19
[(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12,
[Converting iron scraps, &c. into steel.
——— A. (*Fletcher*), 578, Feb. 17, Screw propellers.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29,
[Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.)
[Vapor and gas-engines.
Brunner, W. G. (*Schnabel & Henning*), 505, Feb. 11,
[Portable cranes.
Buchanan, T. R. (*Studwell*), 628, Feb. 30, Economising
[fuel, &c. in steam-boilers.
Buckley, J. B., & Stock, E., 378, Feb. 2, Stench traps.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning
bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Bürgin, E. (Jensen), 506, Feb. 11, Increasing the adhe-
[sion of locomotive wheels on rails.
Burling, E. T., 616, Feb. 19, Pianofortes.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway car-
[riages; tyres.
Bury, S., 465, Feb. 8, Self-acting temples.

Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cottrill, S., 414, Feb. 4, Railway signals.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, W., 642, Feb. 22 (*App.* 8.) Compressing yarn.
—— W., & Howard, J., 277, Jan. 25, Saddle girth
[tightener.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
——— A. H., 374, Feb. 1, Marking and cutting textile
[materials.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-
[menageries.
Crawley, W., 517, Feb. 12, Ships.
Crocker, S.L.,778, Mar. 3 (*App.* 36.)Smelting copper ores.
Cromby, E. E., 425, Feb. 4, Dry gas meters.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
——— *G.*(Morgan-Brown), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
——— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Crosland, W., & Salmon, J., 581, Feb. 17, Grinding and
[polishing stones.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
——— (Bousfield),2084,June 5 (*App.*50.)Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.
Currall, J., 730, Feb. 27 (*App.* 8.) Ventilating buildings.
Cutler, W., 601, Feb. 18, Fermenting vats, &c.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J.T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti-
[lating water-closets, &c.
Dauner, J. L. (Dufrené), 438, Feb. 5, Horse collars.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Daw, M. W., 496, Feb. 10, Scissors.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
——— H., 332, Jan. 28, Chlorine.
——— H., 906, Mar. 11 (*App.* 8.) Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving
[life at sea.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c.
[machines.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.)
[Sewing machines.
Devenport, C., 483, Feb. 9, Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308,
[Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308,
[Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and
[stuffing box.
Dignum, F. B., 515, Feb. 12, Breakers or water casks
[for boats.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixon, G., Maddox, J., Gardner, E., & Hughes, T., 567,
Feb. 16, Fringes.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
——— G. B., 2934, Aug. 20 (*App.* 8.) Steam-engines.
Dolne, L., 534, Feb. 13, Revolvers.
Dominy, G., & Russell, J., 398, Feb. 3, Guards for
[carving forks.
Donald, J., 532, Feb. 13, Stoking apparatus for furnaces.
Donna, J., & Viglino, J. (Morgan-Brown), 626, Feb. 20,
[Motive-power machines.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dows, G. D. (Clark), 544, Feb. 15, Treadle apparatus.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
——— H. A. (*Dauner*), 438, Feb. 5, Horse collars.
Dumont, A., & Alfieri, E., 512, Feb. 11, Lockets.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8,
[Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edison, T. A., 384, Feb. 2, Telegraphs.
Edson, N. T., & Silliman, C. H. (Haseltine), 1677,
[May 5 (*App.* 45.) Paddle wheels.
Edwards, Edmund (*Boullenot*), 75, Jan. 8, Safety lamps.
——— Edmund (*Edwards*), 357, Jan. 30, Rollers for
[fabrics.
Edwards, Ernest (Edwards), 357, Jan. 30, Rollers for
[fabrics.
Edwards, W., 540, Feb. 13, Railway and other wheels.
Ekström, A. H. A., 219, Jan. 20, Centrifugal pumps.
Elce, J., 366, Feb. 4, Spinning and doubling.
Ellis, T., 69, Jan. 8, Preparing yeast.
Ellison, J., 30, Jan. 4, Door fasteners.
Emmerich, O. (Wirth), 193, Jan. 18, Fire-arms.
Enoch, E., 190, Jan. 18, Boring or drilling machine.
Espir, C. (*Le Bricquir*), 291, Jan. 26, Mining powder.
Esterno, F. C. H. P. d' (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
Evans, I., 552, Feb. 15, Handles for parcel and other
[straps, &c.
—— P., & Williams, H., 22, Jan. 2, Stoppering bottles.
Eyquem, J. (Clark), 256, Jan. 22, Steel.

F.

Faber, J. L. von, 178, Jan. 16, Pencils.
Faren, J., 586, Feb. 18, Scutching, &c. fibres.
Farris, W. H. (Lake), 310, Jan. 27, Water circulating bars.
Farwell, W. B., 2126, June 10 (*App.* 50.) Machine guns.
Faure, M. J. F. R., & Kessler, J. L. (Sauvée), 2897,
[Aug. 17 (*App.* 8.) Sulphuric acid.
Fawcett, S., 87, Jan. 9, Looms.
Feldman, J., 88, Jan. 9, Button fastenings.
Felt, G. H. (Newton), 600, Feb. 18, Ordnance.
Fenton, J. & W., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
—— W. & J., & Newsome, C. H., 14, Jan. 1, Card-
[ing, &c. fibres.
Ferry, G. H., & Bradford, J. B. (Haseltine), 484, Feb. 9,
[Filling and corking bottles.
Fewster, W., 293, Jan. 26, Saving life and property at sea.
Fielden, I., 17, Jan. 1, Steam-engines.
Financière de Paris (la Société) (Johnson), 704, Feb. 25
[(*App.* 6.) Treating alunite.

Harrison, G.W.(*Lake*),2774, Aug. 5(*App.* 6.)Harvesters.
——— S. L., 461, Feb. 6, Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine,G.(*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9, Filling
[and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9, Rock
[drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25 (*App.* 35.)
[Surfaces for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning
[bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting
[match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device
[for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork-
[screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.*45.)
[Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread
[spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening
[cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving
[bed.
Hayward, G., Knap, C., & Taunton R. H., 208, Jan. 19,
[Wrought iron tubes.
——— P., & Middleton, W., 493, Feb. 10, Melting,
[&c. metals.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10, Horse-shoe and other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Henning & Schnabel (Brunner), 505, Feb. 11, Portable
[cranes.
Henriot, F. P., 675, Feb. 24 (*App.* 8.) Indicating water
[level in boilers.
Henson, H. H., 575, Feb. 17, Paving.
Hesling, J., 548, Feb. 15, Fulling or milling.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Hickisson, J., 557, Feb. 16, Exhibiting articles for sale.
Higgins, F., & Theiler, R., 423, Feb. 4, "Tell tale"
[clocks.
Higginson, A., 108, Jan. 12, Motive-power engines and
[pumps.
Hildebrandt, A.(*Niemann & Geiger*), 316, Jan. 27, Tram-
[ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Hirsch, J. (*Hirsch*), 576, Feb. 17, Screw propellers.
Hirsch, M. (Hirsch), 576, Feb. 17, Screw propellers.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13,
[Cartridges.
Hodson, C., 371, Feb. 1, Floor, sash, and bench cramp.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers
[and other boilers.
Holland, R., 393, Feb. 3, Fastening wheel tyres.
——— W., & *Myers, H.*, 34, Jan. 4, Umbrellas and
[parasols.
Hollerbusch, M. (Flachfeld), 440, Feb. 5, Pencils.
Holliday, T. (*Schultz*), 498, Feb. 10, Printing fabrics.
——— T. (*Schultz*), 499, Feb. 10, Bleaching fabrics.
Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing
[machinery.
Holmes, R. R., 122, Jan. 13, Aërated liquors.
Holroyde, W. J., 469, Feb. 8, Dredger grapples.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.)
[Steam-boilers.
Holt, T. (Ibbotson), 638, Feb. 20, Grate bars.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other
[articles.
Hough, J. E., Rimington, J. McN., Shepherd, E., &
[Rothwell, F. & T., 350, Jan. 29, Sewing-
[machines.
Howard, J., & Cox, W., 277, Jan. 25, Saddle girth
[tighteners.
Howarth, A. & W., 322, Jan. 28, Dental lathes, &c.
——— J., 240, Jan. 21, Hot-air stoves.
——— W. & A., 322, Jan. 28, Dental lathes, &c.
Howat, A., 580, Feb. 17, Filling, &c. bottles.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop-
[pering bottles, &c.
Howland, R., 524, Feb. 12, Combined almanac, pencil
[case, &c.
Hughes, A., 1311, Apr.10(*App.*42.) Reaping and mowing.
——— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
——— H., 372, Feb. 1, Steam-engines.
——— S., & Turner, J., 392, Feb. 3, Lamp burners.
——— T., Dixon, G., Maddox, J., & Gardner, E., 567,
[Feb. 16, Fringes.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19,
[Bale bands.
Humphries, G. G., & Hutchinson, T., 397, Feb. 3, Em-
[broidering fabrics.
Hunt, B. (*Flagler*), 290, Jan. 26, Welding tubes, &c.
——— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
Hutchenoe, H., & Rider, F. W., 383, Feb. 2, Harmo-
[niums, organs, &c.
Hutchinson, T., & Humphries, G. G., 397, Feb. 3, Em-
[broidering fabrics.
——— W. N., 509, Feb. 11, Stirrups.
Huyttens, T. C. M. (Johnson), 445, Feb. 5, Bread.

I.

Ibbotson, H. W. (*Holt*), 638, Feb. 20, Grate bars.
Imlay, C. G. (Lake), 253, Jan. 22, Preventing fraud by
[tram-car conductors, &c.
Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.
——— J. (*Hahn*), 2903, Aug. 18 (*App.* 8.) Rolling mills.
Ingram, J. G., 235, Jan. 21, Washers and packing pieces.
Isherwood, S., & Weare, R., 326, Jan. 28, Carbonaceous
[material for filtering, &c.

J.

Jachimovicz, C., & Friedlander, J., 266, Jan. 23, Collect-
[ing crops.
Jackson, H., & Milburn, R., 518, Feb. 12, Treating salts,
[ores, &c.
James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
James, J., 284, Jan. 25, Railway carriages and wagons.
Janiot, J. B. (Casalogna), 591, Feb. 18, Printing presses.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*)
[26, Jan. 2, Printing metals.
——— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
——— P. (*Bohlken*), 295, Jan. 26, Washing machine.

Lake, W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18,
[(*App.* 51.) Device for advertising.
—— W. R. (*Harrison*), 2774, Aug. 5 (*App.* 6.) Har-
[vesters.
Lamarre, E. A. A. (Johnson), 409, Feb. 3, Signalling
[and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing ma-
[chines, &c.
Larkin, J. B. (Lake), 472, Feb. 8, Furnace grates.
Laslett, T. N., 523, Feb. 12, Measuring heights and
[distances of objects.
Law, J. H., Redfern, T., & Smith, P., 431, Feb. 5, Paper
[making.
Lawrance, E., 796, Feb. 30 (*App.* 8.) Curing corns.
Laycock, P., 572, Feb. 17, Stiffening & staining fabrics.
—— W. S., 478, Feb. 9, Electric breaks.
Lazar, A. (Lake), 536, Feb. 13, Railways.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14,
[Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining
[powder.
Lee J., 131, Jan. 13, Fire-arms.
— J. W., 481, Feb. 9, Rotary pumps.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Legat, D. M. (Clark), 463, Feb. 6, Sewing straw hats, &c.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181,
[Jan. 16, Phosphates and phosphorus.
—— H., Box, J., Aubertin, E., & Boblique, L., 214,
[Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway
[sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Lewis, G. H., 137, Jan. 13, Cigars.
—— R. T., 237, Jan. 21, Looking glasses and mirrors.
Liancourt, C. A. Count de G. de, 390, Feb. 3, Preserving
[life at sea.
Lillie, J., 606, Feb. 19, Kitchen ranges, &c.
Lind, J., 457, Feb. 6, Securing ends of bale bands.
Livesey, J., 599, Feb. 18, Railways and tramways.
Lloyd, J., & Scully, J., 226, Jan. 20, Drying wall
[papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Loebl, S., 614, Feb. 19, Heating and cooking apparatus.
Loewenberg, H., 420, Feb. 4, Imitation braids, leather, &c.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c.,
[threads ; stop motion.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Lontin, D. F. (Clark), 473, Feb. 8, Application of electro-
[dynamic machines.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing
[slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and
[axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.)
[Thread-spools, pail-handles, &c.
Lyte, F. Maxwell (Clark), 563, Feb. 16, Ammonia.
Lyttle, W. A., 105, Jan. 12, Iron, steel, &c.
—— W. A., 455, Feb. 6, Making alkali, &c.
—— W. A., 627, Feb. 20, Alkali.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving
[substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Com-
[positions for paving, &c.
MacDonald, J. C., & Calverley, J., 611, Feb. 19, Print-
[ing presses.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c.
[waste products.
—— M., 200, Jan. 19, Compounds for dissolving
[resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing
[instruments.
Maclaren, J., 415, Feb. 4, Watch protector.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M.,
[76, Jan. 8, Railway wheels and axles.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing
[stones, &c.
Maddox, J., Gardner, E., Hughes, T., & Dixon, G., 567,
[Feb. 16, Fringes.
Maes, L. (*Fouillon*), 331, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 19,
[Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscrip-
[tions, &c.
Malo, G. (Clark), 404, Feb. 3, Ships or vessels.
Manbré, A., 579, Feb. 17, Treating vegetable substances;
[making spirits, &c.
—— A., Beldam, W. A., & Allibon, G., 264, Jan. 23,
[Steam-boilers.
Mann, W., & Owens, S., 862, Mar. 9 (*App.* 8.) Valves.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard
[railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Marchant, R. M., 304, Jan. 27, Furnaces.
Marillier, R. A., 497, Feb. 10, Raising, tipping and
[lowering trucks.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marot, L. (Johnson), 408, Feb. 3, Saccharine solutions.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, F. A., Skinner, C. W., & Hall, W. J., 530,
[Feb. 13, Feed heaters for boilers.
—— J., 162, Jan. 15, Thrashing machines.
—— N., 583, Feb. 18, Fancy hosiery.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
Martin, T., 468, Feb. 8, Lamps.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
—— J., & Spier, R., 622, Feb. 20, Gas.
—— W., & Cordillot, H. F. A., 479, Feb. 9, Steaming
[printed fabrics.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted
[fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.*
[44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Maxwell-Lyte, F. (Clark), 563, Feb. 16, Ammonia.

Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls.
Maynard, R., 879, Mar. 10 (*App.* 8.) Chaff-cutters.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
——— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.*
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Melton, F., 620, Feb. 20, Nail and other brushes.
Melvill, R. A., 554, Feb. 15, Fastening windows, &c.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped
[axles.
Middleton, W., & Hayward, P., 493, Feb. 10, Melting,
[&c. metals.
Milburn, R., & Jackson, H., 518, Feb. 12, Treating salts,
[ores, &c.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8
[(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
—— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Mitchell, J. & W., 410, Feb. 3, Umbrellas and parasols.
——— W. & J., 410, Feb. 3, Umbrellas and parasols.
——— W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V,, 625, Feb. 20,
[Filtering water.
Monk, W., & Rawsthorne, T., 435, Feb. 5, Carding en-
[gine rollers.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20,
[Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
——— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and
[windows.
————— W. (*Crompton*), 146, Jan. 14, Looms.
————— W. (*Viglino & Donna*), 626, Feb. 20,
[Motive-power engines.
————— W. (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
————— W. (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of
[type.
————— W. (*Johnson & Harding*), 2250, June 19
[(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-
[way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying
[gas for aërial purposes.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and
[utilizing steam.
Mountford, E. C. & W., 292, Jan. 26, Games.
——— W. & E. C., 292, Jan. 26, Games.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit-
[ting hats, &c.
Munn, A., Rennie, J., & Sutherland, J., 419, Feb. 4,
[Sinking cylinders for foundations.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.)
[Sewing-machines.
Murray, A. W., 382, Feb. 2, Lamps.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and
[parasols.
Myers, M., 570, Feb. 17, Pen boxes, &c.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Napier, W. D., 633, Feb. 20, Tooth and flesh brushes or
[rubbers.
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Neil, C., 402, Feb. 3, Stocks and dies.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Newbold, E., 267, Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding,
[&c. fibres.
Newton, A. V. (*Borchart*) 385, Feb. 2, Bullet patching
[machinery.
——— A. V. (*Felt*), 600, Feb. 18, Ordnance.
——— E., 624, Feb. 20, Frame saws.
——— H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding
[engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27,
[Tramways.
Noad, J, 592, Feb. 18, Steel.[1]
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Nussey, G. H., & Leachman, W. B., 139, Jan. 14, Punch-
[ing and rivetting machines, &c.

O.

Oexle, O. (Johnson), 561, Feb. 16, Grinding corn, &c.
Olpherts, R., 560, Feb. 16, Screw presses, &c.
Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13,
[Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Osborne, D. M. (Lake), 471, Feb. 8, Harvesting ma-
[chines.
Osmond, J., 547, Feb. 15, Dog-carts, &c.
Outerson, A. & J., 558, Feb. 16, Filters.
——— J. & A., 558, Feb. 16, Filters.
Owens, S., & Mann, W., 862, Mar. 9 (*App.* 8.) Valves.

P.

Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine),
[1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Parker, G., 556, Feb. 16, Riddling and loading coal, &c.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and
[engines.
Payton, W., & Holmes, J. E., 343, Jan. 29, Sawing
[machinery.
Peacock, J. C., & Rudkin, T., 590, Feb. 18, Cooking, &c.
Pearson, D. R., 516, Feb. 12, Backs and handles for
[brushes.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces,
[purses, &c.
Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
——— W., 533, Feb. 13, Communicating in trains.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Petit, H. J., 501. Feb. 10, Sewing-machines.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485
[Feb. 9, Rock drills.

Pictet, R. P., 2727, Aug. 3 (*App.* 6.) Sulphurous acid;
[producing cold.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieper, C. (*Kaselowsky*), 535, Feb. 13, Steam-boilers.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drink-
[ing bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
—— R. P., 448, Feb. 6, Trapping waterclosets, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2,
[Preparing fibres for spinning.
Porter, E. B. (Clark), 1042, Mar. 22 (*App.* 7.) Screw
[propellers.
Porter, G., 430, Feb. 4, Gas-burners.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Venti-
[lating water closets, &c.
Pounsett, R., 447, Feb. 5, Vinegar.
Powleson, W. L., 2565, July 17, (*App.* 4.) Steam super-
[heaters.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Puente, S., 436, Feb. 5, Sheep shear.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank
[or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21, Creased or
[plaited fabrics.
Rawsthorne, T., & Monk, W., 435, Feb. 5, Carding en-
[gine rollers.
Read, W., 379, Feb. 2, Buttons; attaching same.
Reckendorfer, J. (Marler), 215, Jan. 20, Pencil cases.
Redfern, T., Smith, P., & Law, J. H., 431, Feb. 5, Paper
[making.
Redheffer, W. (Benson), 388, Feb. 3, Freezing, churn-
[ing, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit-
[ting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reeves, T., 424, Feb. 4, Sewing-machines.
Reid, W., 166, Jan. 15, Sewing machines.
Rennie, J., Sutherland, J., & Munn, A., 419, Feb. 4
[Sinking cylinders for foundations.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201,
[Jan. 19, Railway signals and points.
——— G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Richardson, J., & Ball, C. J., 564, Feb. 16, Combined
[engine, &c., and air compressor.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for
[floors, &c.
Rider, F. W., & Hutchenee, H., 383, Feb. 2, Harmo-
[niums, organs, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., &
[Hough, J. E., 350, Jan. 29, Sewing machines.
Roberts, A. & G., 636, Feb. 20, Pianofortes.
——— G. & A., 636, Feb. 20, Pianofortes.
——— T., 585, Feb. 18, Ships.
——— W. A., & Tantum, A. J., 443, Feb. 5, Work-
[ing sewing-machines.
Robinson, C. E. (Clark), 338, Jan. 28, Feeding and
[burning oils in furnaces.
Robinson, G. A., & Kendall, W. J., 588, Feb. 18, Castors.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing
[machines, &c.
——— H. (*Mullholland*), 161, Jan. 15, Cut nails.
——— J., 598, Feb. 18, Water columns.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting
[ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Rood, G. A., & Hallett, B., 630, Feb. 20, Bicycles.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
——— T. & F., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway
[signalling.
——— *D.* (Clark), 2740, Aug. 4 (*App.* 6.) Railway
[signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and
[forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
——— S. H., 649, Feb. 22 (*App.* 8.) Waterclosets.
Rudkin, T., & Peacock, J. C., 590, Feb. 18, Cooking, &c.
Russell, H., 109, Jan. 12, Registering garments, &c.
[sent to laundries.
——— J., & Dominy, G., 398, Feb. 3, Guards for car-
[ing forks.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.
Ruthven, W., 587, Feb. 18, Fire-lighters.
Rydill, G., 150, Jan. 14, Purifying sewage, &c.
———G., 399, Feb. 3, Purifying sewage, &c.

S.

Salmon, J., & Crosland, W., 581, Feb. 17, Grinding and
[polishing stones.
Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
[cussion caps.
Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.
——— A. (*Faure & Kessler*), 2897, Aug. 17 (*App.* 8.)
[Sulphuric acid.
Savage, W. P., 271, Jan. 23, Preventing accidents on
[railways.
Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25
[(*App.* 35.) Surfaces for steps, &c.
Scantlebury, W., & Rath, F., 232, Jan. 21, Creased or
[plaited fabrics.
Schnabel & Henning (Brunner), 505, Feb. 11, Portable
[cranes.
Schofield, C. J., 511, Feb. 11, Furnaces.
Schrebler, G., 477, Feb. 9, Pistons.

Thayer, L. O. (*Smith*), 2513, July 13 (*App.* 3.) Com-
[pound for dental plates, &c.
Theiler, R., & Higgins, F., 423, Feb. 3, "Tell-tale" clocks.
Thiery, C. L., 2367, June 29 (*App.* 1.) Watch cases, &c.
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3. Index of Names to Chronological and Descriptive Index from January 1 to **February** 20, 1875, and to Appendixes from February 21 to August 20, 1875.

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This invention consists in immersing the "finished black plates" in a solution of a salt of tin with excess of acid and afterwards in molten tin or terne metal. They are then finished as in the ordinary process.

A.D. 1875, February 22.—No. 645.

FAWCETT, Thomas Constantine, of Leeds, in the county of York, engineer, and **ALLEN**, Charles Bowman, of the same place, foreman.—"Improvements in or applicable to brick-making machines."

This invention relates to means or apparatus to be employed for lubricating the faces of the moulds in brick-making machines. The oil or other lubricant is fed into a cylinder large enough to contain a sufficient quantity of lubricant for the face of one die, over which it is distributed by a "rose."

A.D. 1875, February 22.—No. 646.

CAVE, John O'Connell, of Weston-super-Mare in the county of Somerset.—"Improvements in the "construction of torpedoes, and in the means and method of towing and guiding the same."

A kite is attached to the torpedo by means of a cord, line, or lines of the requisite length to enable it to acquire the necessary height for the purpose of towing the torpedo. The cord, line, or lines is or are so attached that the flat side of the keel of the torpedo offers an oblique resistance to the kite, thus causing them both to travel obliquely. The kite is sometimes furnished with a central vertical wing, fan, or rudder, fixed obliquely, and the torpedo is, when desired, provided with a suitable rudder which can be fixed at any angle. In the case of a submarine torpedo, it is caused to remain at any desired depth by being attached to a hollow cylinder or tube placed parallel thereto. Balloons may be used instead of kites, or in combination with them, or inflated kites may be employed.

A.D. 1875, February 22.—No. 647.

MULHOLLAND, Joseph Richardson Turtle, and **PORTER**, William Mulholland, of Belfast, in the county of Antrim, Ireland.—"Improvements in carding engines for flax, tow, hemp, jute, and other "fibres."

This invention relates to the adaptation to carding engines of a novel arrangement of "flats" or bars filled or covered on one side with pins, and which move in the same direction as the cylinder whilst in contact therewith but at a slower speed. These flats or pin bars are carried upon endless sheets or chains, and are maintained in their position with respect to the cylinder by rollers and suitable guides.

A.D. 1875, February 22.—No. 648.

WYRILL, Moses Bottomley, of the firm of Moses Bottomley and Sons, of Shelf Mills, near Halifax, in the county of York, spinners and manufacturers—"Improvements in machinery for preparing and "combing wool or other fibrous substances."

This relates to a "stop motion" for the machine when a lap forms on the drawing-off-rollers or leathers, and consists of a lever hinged to a stand fixed to the frame of the machine, one end of said lever resting on the rubber, the other end catching and holding a spring lever.

A.D. 1875, February 22.—No. 649.

ROWLEY, Samuel Hunt, of Swadlincote, in the county of Derby, earthenware manufacturer.—"Improvements in water closets."

This invention refers to those closets which have an outlet pipe at the side of the basin, and in which a certain amount of water remains at the bottom of the basin, not to form a seal, but to receive the soil. The Provisional Specification describes admitting the whole or the greater part of the flushing water to the basin at a point diametrically opposite the outlet, so as to ensure that the contents of the basin are carried off.

A.D. 1875, February 22.—No. 650.

FAIRBROTHER, James, of Sheffield, in the county of York.—"Improvements in machinery for "drawing or turning up and straightening paragon wire."

My invention relates to the drawing or turning up and staightening of paragon wire, and wire of a similar description, and consists of certain improvements in machinery employed for performing those operations.

A.D. 1875, February 23.—No. 657.

EDMONDSON, James, of 7, Church Street, Manchester, merchant, and **WADSWORTH**, James, of Collyhurst Road, Manchester, machinist.—"Improvements in the manufacture of nails, and apparatus "for the same."

The improvements relate to the manufacture of nails for application to the soles and heels of boots and shoes, to render the same more durable at a cheap cost combined with lightness. The nails are cast or forged in suitable shapes (flatly by preference) with short and thin spikes or shanks, and with a bevel edge round the head. This bevel edge is, by means of die presses, forced or bent over so as to form a sharp or feather edge in the same direction as the spike or shank, thus enabling the nail when driven into the leather to become in a measure embedded therein. The spikes or shanks are also subjected to a milling, corrugating, screw threading, or die pressing process, either by means of a second operation, or in combination with the former, which may be accomplished by "fly" or "stamper" presses of the ordinary kind, or by means of steam or other power applied to a travelling or revolving table containing a number of dies or portions thereof, each die being fitted with a self-acting piston, or with self-acting levers for the purpose of ejecting the nails from the dies as they are completed.

A.D. 1875, February 23.—No. 658.

POTTER, Edmund Peel, of Little Lever, near Bolton, in the county of Lancaster.—"Improvements "in the construction of apparatus used for the concentration of sulphuric and other acids, and for "other similar purposes."

This invention relates to that class of apparatus used in the concentration of acids or saline, or other solutions, wherein a series of retorts are placed at a gradually descending level, and heated by furnaces or flues, and the acid or other liquid in passing in succession from the first retorts to the last or lowest becomes gradually evaporated or concentrated, the action being continuous.

A.D. 1875, February 23.—No. 659.

CHOMEL, Isaac Antoine, formerly of the city and state of New York, United States of America, but now of 6, Christchurch Road, Hampstead, in the county of Middlesex.—"An improved apparatus for "suspending things in equipoise."

The invention is applicable for the suspension of berths, couches, cabins, tables, boxes for damageable articles or for cattle, platforms for artillery and other things, mariner's compasses and other nautical or mathematical instruments, on board ships, in vehicles for land transport, or in other places where great steadiness of the thing suspended is desireable.

It consists of an articulated frame in three members. The two outer members are hung at one extremity, each upon a pivot, the central member being jointed to and hung between the outer two. The whole articulated frame can move freely in any direction upon the said pivots. The thing to be suspended is hung in bearings upon the articulated frame. Beneath the articulated frame an arc is fixed in constant relative position to that of the two pivots aforesaid; this arc holds the extremity of an arm or arms fixed to and projecting from the bottom of the thing suspended.

When the whole apparatus is in a horizontal position the axes of the two pivots are in the same right line A; the axes of the two bearing upon the articulated frame are in another right line B, which is by preference at a lower level than the line A; the vertical planes containing these two right lines are at right angles. The right line B, the centre lines of the arm or arms projecting from the bottom of the thing suspended, and the line of the arc fixed beneath the articulated frame are all in the same vertical plane.

The arc is struck from a centre upon the right line A where the vertical plane of the line B cuts it.

A.D. 1875, February 23.—No. 660.

BATES, George, of Lewes, in the county of Sussex, ironmonger.—"Improvements in apparatus for "attaching main cocks, valves, plugs, or other connections to service pipes for water when under "pressure."

An apparatus for opening out the ends of service pipes without shutting off rom the main, consisting of a tube to pass over the end of pipe, and fitted with a stuffing box through which spindles are passed to open out the pipe, and also to plug the end while a top valve or union is being soldered or screwed in, which may be done while full pressure is in the pipe.

A.D. 1875, February 23.—No. 661.

TRABUE, William, of Louisville, in the county of Jefferson and state of Kentucky, one of the United States of America.—" Improvements in the manufacture of needles and apparatus therefor."

This invention consists in the combination of devices whereby the needle wire is pressed into shape and the excess of metal cut away.

A pair of swaging rolls mounted in a bifurcated frame, having their sides cam-shaped, to throw off and hold away at the proper time a pair of milling cutters which rotate in a plane at right angles to the plane of rotation of the swages, and turn off the fin formed by the swaging.

A.D. 1875, February 23.—No. 662.

SYKES, William Robert, of Nunhead, in the county of Surrey, telegraph engineer.—" Improvements in signalling or working signals on railways and in the means or apparatus employed " therein."

This Provisional Specification describes a novel system of signalling or of working signals whereby it becomes impossible for a signalman to give the signal for a train to proceed until he has received a signal from the next station or signalling point that the previous train has passed. The system is in fact a combined lock and block system, the movement of a signal lever for a train to proceed having the effect of locking that lever until the lock is released by the movement of a lever at the next station or signalling point after the train has passed it, while the lever at the said next station cannot be moved until freed by the movement of a lever at a third station or signalling point shewing that the line between the second and third points is clear.

A.D. 1875, February 23.—No. 663.

GREIG, David, and EYTH, Max, both of the Steam Plough Works, Leeds, in the county of York.— " Improvements in steam ploughing, traction, mining, portable, and other engines."

This Provisional Specification describes,—

1. A cut off arrangement which consists of a D valve with a cut off plate at its back. The cut off plate moves with the valve until arrested by fixed stops The valve is actuated by a link motion.
2. A feed water heater on the smoke box door.

A.D. 1875, February 23.—No. 664.

GARFIELD, William, of Birmingham, in the county of Warwick, manufacturer.—" Improvements " in the manufacture of metallic handles for tea and coffee pots, jugs, and other vessels and articles."

This invention consists in making metallic handles of two longitudinal half handles, and a lining or strengthening piece between them. The lining piece has the general figure of one of the half handles, but is of less size. In putting the parts of the handle together, the lining piece is placed in one of the half handles with its convex side outwards and soldered thereto. The second half handle is then placed edge to edge upon the prepared half handle and upon the lining piece, and the parts soldered together, the solder running between the lining piece and the abutting edges of the half handles.

A.D. 1875, February 23.—No. 665.

ASHER, George, of Balsall Heath, near Birmingham, in the county of Warwick, designer and modeller.—" Improvements in soldering irons."

This invention consists of a soldering iron to be heated by gas or by a gaseous mixture constructed as follows :—

The head of the iron is hollow and perforated and carries the soldering bit. The stem as well as the handle of the iron is hollow, and through the hollow handle the gas is conveyed. The inner end of the handle terminates in a fine jet or hole, and air holes are made in the stem near the said handle.

Gas being admitted to the hollow handle it passes into the stem, where it mixes with atmospheric air, and the gaseous mixture enters the hollow and perforated head of the soldering iron, where it is ignited and forms a colourless or nearly colourless flame jet, which jet is projected upon the inner end of the soldering bit, and the latter is thereby rapidly heated.

A.D. 1875, February 23.—No. 666.

ATKINS, James, of the firm of Robert Walter Winfield and Company, of Birmingham, in the county of Warwick, merchants and manufacturers.—" Improvements in the construction and ornamentation " of metallic bedsteads and cots."

This invention consists in constructing and ornamenting the head and foot ends of bedsteads and cots and parts connected with the said ends in the following manner :—The head or foot end is made of a foundation of wood, covered or partially covered with fabric or non metallic material, and inserted in or fixed to a metallic frame. This covered foundation is ornamented by the fixing thereon of mouldings, designs, or devices made preferably of metal. The ornamented end, fixed in a metallic frame, is connected to the bedstead frame by lugs on the corner blocks. The vertical sides of the metallic frame carrying the ornament end replace the ordinary pillars in half tester and French bedsteads, and also in cots. For four post bedsteads the head and foot ends are used with the ordinary corner blocks and pillars.

A.D. 1875, February 22.—No. 667.

WHETTEM, William Henry, of Gateshead, in the county of Durham, and, **WALKER**, Edmund, of Leadenhall, in the city of London.—" Improved arrangement of appliances for protecting ships' propellers and for increasing the efficiency of the same while at work."

Parallel coned or tapered rings are fitted round propellers at a slight distance from the ends of the blades. The rings are held in position by stays and butt plates over the meeting ends, the stays fastening the ring to the vessel. In some cases the rings have projecting strips on their inner faces, the object being to prevent the water being spun round in the rings.

A.D. 1875, February 23.—No. 668.

NEUHAUS, Mathias, of Surrey Chambers, Strand, in the county of Middlesex, civil engineer.—"Improved means and appliances for the production of lighting and heating gas from air and " spirituous vapour combined."

This consists mainly in causing jets of air under pressure to draw liquid from a reservoir and spray it in a chamber, the jets rising vertically to produce a thorough dissemination prior to the impregnated air passing off for burning.

A.D. 1875, February 23.—No. 669.

PINCHBECK, John, of No. 19, Salisbury Street, Strand, London, and 3, York Buildings, Dale Street, Liverpool, civil engineer.—" Improvements in fire-lighters."

Constructing or forming fire lighters by making a body-piece and boring or forming holes therein at suitable angles for receiving the upper partions of several legs driven thereinto to form a stool-like structure. The body and the upper portion of the legs together being then dipped into a resinous mixture or composition the fire lighter is completed ready for use.

A.D. 1875, February 23.—No. 670.

MYLES, William, of Toronto, in the Dominion of Canada, at present residing at Mullin's Hotel, Cheapside, in the city of London.—(*Partly a communication from Charles Levey, of Toronto, aforesaid.*) —" Improvements in nuts and washers."

According to this Provisional Specification radial grooves or recesses are made in the front end of the nut, commencing near the hole which is made through the nut, and being made deeper and deeper as they come to the exterior of the nut. When the nut is screwed home a portion of the circumference of the washer is bent upwards to cause it to rise up into one or other of the recesses. The washer is prevented from turning by projections upon it entering recesses in the surface against which it is applied.

A.D. 1875, February 23.—No. 671.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Amos Worthington Thomas, of Philadelphia, Pennsylvania, United States of America, manufacturer.*)—" Improvements in bustles and pads for ladies' dress."

closes the pipe against escape. Instead of using a glass a thin copper pipe may be employed, the wire inside having on it a piece of iron or magnet, and an iron ring or magnet index being fitted to slide freely outside the pipe, the outer ring or index following the movements of the piece inside. By turning up the water pipe of the float vessel and placing the float in the turned up portion, the pipe below may be kept free from water.

A.D. 1875, February 24.—No. 676.

IMRAY, John, of No. 20, Southampton Buildings, Chancery Lane, in the county of Middlesex.—*(A communication from Jacob Heberlein, of Munich, in the Kingdom of Bavaria.)*—" Improvements in " brakes for railway trains, and in apparatus for working the same."

This invention relates in part to improvements in brake apparatus of a kind described in Specns. to Patents granted to J. Heberlein on the 11th April, 1872, No. 1071, and to J. Imray on the 17th May, 1872, No. 1508, and on the 19th June, 1872, No. 1849. For taking up rapidly the slack of such apparatus the first links of the chains are made long and are jointed to crank arms on the winding pullies, so that at the commencement of motion the chains are rapidly drawn in. For communicating the pull of the chains to the brakes they are made to act on a lever having its fulcrum and arm connected respectively to brake levers before and behind, the lever being so proportioned as to equalise strain on the several wheels. Part of the present invention relates to an improved form of brake which may be worked by apparatus of the kind above referred to or by other known means. The improved brake consists of a curved strap faced with pieces of metal or wood, which strap passes over the upper part of the wheel and is jointed at its one end to one arm of a bar and at the other end to a lever pivotted on the other arm of the bar; the said bar being mounted on the axle of the wheel or on its box, so that the action of the brake is rendered independent of the carriage springs, and the pressure being downwards on the wheel no lateral strain is thrown on the axles.

A.D. 1875, February 24.—No. 677.

CRANSTON, William McIntyre, of No. 36, Worship Street, Finsbury, in the county of Middlesex.—*(A communication from Franklin Scott, of Bennington, state of Vermont, in the United States of America.)* —" Improvements in portable lathes chiefly intended for the use of dentists and jewellers."

An adjustable stem is fitted in a vertical standard upon tripod feet. This stem carries a kind of table also adjustable, in the under part of which radial spindles can be driven from an underneath motion. The radial spindles carry chuck plates, on or to which the operating tools can be fitted. The table can be turned upon the stem to bring any one of the tools or appliances round to a suitably arranged rest, in which position it can be locked by a cramp. The lathe can be used by one or more men as desired.

A.D. 1875, February 24.—No. 678.

WIRTH, Frank, of the firm of Wirth and Company, patent-agency, of Frankfort on the Main, in the Empire of Germany.—*(A communication from William Knaust, manufacturer, a person resident at Vienna, in the Empire of Austria.)*—" Improvements in stop-valves."

The said invention consists, first, in a closing arrangement in combination with two conical pieces, the surfaces of which are parts of a circular cone or of any other rotating body. Second, in the pressing of the said conical pieces in their seats by means of a wedge which only follows the upward and downward movement of a vertical spindle but not the rotating movement of the latter.

A.D. 1875, February 24—No. 679.

WIRTH, Frank, of the firm of Wirth and Company, patent agency, of Frankfort on the Main, in the Empire of Germany.—*(A communication from Heinrich Kuhlmann, a person resident at Glückstadt, in the Empire of Germany.)*—" Improvements in pegging-machines to be used in the manufacture of boots " and shoes."

This invention relates to machinery to be used in the manufacture of boots and shoes. I may distinguish the following four movements in the mechanism, namely; first, that of the awl; second, that of the hammer; third, that of the advancing of the wood strap and the operation of the cutter; and, fourth, the movements of the support.

A.D. 1875, February 24.—No. 685.

CLARKE, Samuel, and CLARKE, Samuel Birdsey, both of 110, Albany Street, Regent Street, in the county of Middlesex.—" Improvements in night-lights."

This Provisional Specification describes forming night lights of tallow mixed with a small proportion of camphor.

A.D. 1875, February 24.—No. 686.

WAY, John Thomas, of 9, Russell Road, Kensington, in the county of Middlesex.—" Improvements " in the production of soluble phosphates of lime.".

This Provisional Specification describes

1. An improved method of producing chlorophosphate of lime, a compound of the acid phosphate of lime with chloride of calcium.

2. Means of separating chloride of calcium from chlorophosphate of lime, leaving the phosphate of lime in a pure or nearly pure state.

A.D. 1875, February 25.—No. 687.

HARDY, Thomas Edmund, of Battersea, in the county of Surrey.—(*A communication from Henry Royall Minns, of Chambly Canton, in the Dominion of Canada.*)—" An improved artificial leather."

The feature of novelty of this invention consists in combining together manilla, jute, leather scraps or skivens, tan, logwood, rosin, size, soda-ash, alum, and venetian red, which are reduced to a pulp, dried, calendered, and manufactured into sheets of artificial leather.

A.D. 1875, February 25.—No. 688.

JONES, Thomas Octavius, of 8, Blackheath Hill, in the county of Kent, manufacturer.—" Improvements in the manufacture of ferrules for umbrellas, walking sticks, and such like articles."

This invention consists in the addition to the ordinary ferrule of a screw with a head, which is accomplished by boring a hole through the centre of the bottom of the ferrule, such hole being plain or threaded to admit of a screw or plain pin being inserted in it; the bottom or outer end of this pin is terminated by a hollow or solid piece of metal, to form a head sufficiently large to cover the bottom of the ferrule. When this head wears out it may be unscrewed without taking the ferrule off the stick, and a new pin or screw with a head inserted.

The ferrule may be made to screw on the stick or rivetted in the usual manner.

This invention can be made in any kind of metal or other hard substance.

A.D. 1875, February 25.—No. 689.

BECK, Joseph, of Cornhill, in the city of London.—(*A communication from Messieurs James W. Qu[illegible] and Company, of the city, county, and state of New York, in the United States of America.*)—" An " improved prism for spectroscopic and other purposes."

This invention consists in the construction of a prism either hollow and filled with bi-sulphide of carbon or other dispersive fluid or solid of glass or other transparent substance in such a manner that the incident ray and the mean ray of the emergent pencil shall be in the same right line: that is, the action of the prism is direct, giving obvious advantages over the common form.

A.D. 1875, February 25.—No. 690.

ASCOUGH, William, of Buffalo, in the county of Erie and state of New York, one of the United States of America.—" A combined bevel, square, protractor, slope level, spirit level rule, and " compasses."

The chief feature of novelty in this invention is the construction of a combined instrument, a bevel, square, protractor, slope-level, spirit-level rule, and compasses, in such manner that, while it will answer the purpose that any of these tools separately would do, it forms within itself, as it were, one probable reliable and useful instrument.

and below the revolving horse is covered by plates of iron, wood, or other suitable material of the size and shape of one of the sections formed by the divisions. The remaining portion of the floor at the ground level is an open grating.

For heating the closet, the chamber is erected with a pit sunk below the level of the flooring above referred to, and a metal furnace is placed in the closet, but with one side open to the outer wall for facility of feeding. From this furnace a flue pipe is carried first circuitously and then vertically through the centre of the chamber to the roof, and finally through a ventilating flue of brick or other material to the outer air. Air is admitted to the lower part of the drying chamber through flues or openings, and emitted through the opening in the roof above referred to.

When all the sections of the horse are full, a valve in the bottom and top plate may be opened to admit the heated air to that section that otherwise would be closed from the heat.

A.D. 1875, February 25.—No. 696.

QUICK, Joseph, junior, and RESTLER, James William, of Great George Street, Westminster, in the county of Middlesex.—" Improvements in meters for measuring liquids."

Two pistons connected by a rod are moved to and fro under pressure of inflowing water after acting upon valves fitted in a part of the casing.

A.D. 1875, February 25.—No. 697.

RENDEL, Alexander Meadows, of 8, Great George Street, Westminster.—" Improvements in swing " bridges."

This Provisional Specification describes a swing bridge which may be but little longer than the channel to be bridged over; this is effected by placing an open framework or a pontoon under the bridge intermediate of its length and provided with rollers to run on a roller path at the bottom of the channel: and also describes means by which the bridge, when in position for traffic to pass over it, may rest upon solid supports, and by which, when the bridge it is to be swung to one side, it may be set free from the supports upon which it previously rested.

A.D. 1875, February 25.—No. 698.

COLE, Frederick, of Victoria Park Road, South Hackney, in the county of Middlesex, engineer.— " Improvements in apparatus for hanging, opening, closing, and securing sliding window sashes, " shutters, and doors."

This invention consists firstly in improved arrangements and combinations of screws, nuts, and gearing applied to sliding sashes, sliding shutters, and sliding doors, for hanging, opening, and closing the same, and whereby they are firmly secured when closed and kept in any position to which they may be opened.

Secondly, in the application and employment of an endless chain and pulley arrangement for hanging sliding sashes, shutters, and doors.

A.D. 1875, February 25.—No. 699.

LOMAX, John, of Leyland, near Preston, manager, and **ATHERTON, William**, of Preston aforesaid, machine maker, both in the county of Lancaster.—" Improvements in looms for weaving."

This invention relates, first, to pattern chains used in looms for weaving fancy or pattern fabrics, and consists in an improved mode of fastening the snugs, knobs, buttons, or projections to the cross legs or bars forming the links of the chain carried and travelled by the ordinary chain wheels. Instead of placing the snugs or knobs in square holes in the lags or bars and fastening each by a screw fitted to a screwed hole in the snug, circular holes are made in the lags or bars and fit into them round pins or projections at the bottoms of the snugs, and hold the snugs firmly to the bars by a rod which passes through a hole in each round pin or projection, and also through snugs or projections at each end of each lag or bar, and is kept in its place by a pin, bolt, or key.

Another part of these improvements consists in the employment of springs connected to treadles worked by the pattern chain, thereby preventing any strain on the healds and warps.

A.D. 1875, February 26.—No. 706.

LAND, Edward, of Manchester, in the county of Lancaster.—" Improvements in the method of and " in appliances for propelling canoes and row-boats."

The inventor makes a joint in the scull which is mounted in two sets of bearings or row-locks, so that the rower can face the point to which he is rowing. The scull or blade may revolve to effect the feathering.

A.D. 1875, February 26.—No. 707.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Victor Guérin, of Paris, France.*)—" Improved apparatus for enlarging and " reducing designs, prints, and other delineations."

The apparatus consists of a circular sheet of india rubber on which the design is impressed, held in a frame and drawn over a fixed disc by a nut caused to travel up and down a screw pillar by means of a hand wheel.

A.D. 1875, February 26.—No. 708.

SAINTY, John, of Wisbeach, St. Peter's, Cambridgeshire, manufacturer of agricultural and horticultural implements.—" Dressing and drying corn and seeds of all kind with self feeding appliances."

My invention relates to the saving of labour by means of self feeding elevators; the feeder is placed against the corn heap; the corn or seed is screened up to the feeder; the feeder regulates the corn or seed unto the elevator and convey it into the dressing machine; when dressed it convey the corn unto the elevator at the opposite end of the machine and deposite it into the bag or sack.

I prefer the corn or seed to be elevated by a series of elevating strips to allow the air to have its drying and purifying influence upon the corn or seed; by this arrangement the corn or seed is kept in an agitated state before it is deposited into the sack.

I introduce the buffers for the purpose of dislodging any obstruction on the riddles or screen and allow the corn or seed to pass through the riddles and screen more freely.

By means of the lattice regutator working in groves at the mouth of the fann it can be arranged so the smallest seed can be cleansed from dirt and chaff and ordinary seeds disposed of and seperated.

I prefer using a jointed connecting rod attached to an angular or T shaped joint which is connected to the excentric of the machine which dispence with gearing is a saveing of labour and expence which give the riddles and screen there nessary motion.

A.D. 1875, February 26.—No. 709.

REYNOLDS, Frederick William, of Southwark Street, in the borough of Southwark, merchant.—" Improvements in steam or hand circular saw and band saw benches or machines."

By means of supports and a cross shaft attached to the central shaft of the machine the feeding apparatus is greatly strengthened.

A.D. 1875, February 26.—No. 710.

WARWICK, James, of Manchester, in the county of Lancaster.—" Improvements in sewing- " machines."

This invention is principally applicable to that class of sewing machines wherein spools are employed for carrying the sewing thread; and consists of a simple arrangement applied to the flywheel of the machine, whereby the spools can be wound without either turning the machine or removing the thread from the needle, and thus saves trouble and wear and tear of the machine whilst winding spools; but it also at same time, in some cases, prevents the possibility of the machine being propelled in the wrong direction, which breaks the thread and injures the machine; and for this purpose it is also equally applicable to other sewing machines.

A.D. 1875, February 26.—No. 711.

JACOB, David, of Maryborough, Queen's County, Ireland.—" Improvements in machinery or apparatus " for distributing artificial manures, also applicable for other purposes."

A trough with perforated bottom having a lateral motion imparted to it is used. The manure is fed into trough from a hopper.

A.D. 1875, February 26.—No. 715.

TROTMAN, Sanders, of Stowmarket, in the county of Suffolk, engineer.—" Improvements in the " mode and means of generating and inflaming gaseous vapour in lamps or other apparatus containing " petroleum spirit or other hydro-carbon fluid or highly volatile oils."

This invention has for its object an improved method of vaporizing petroleum spirit or other hydro carbon fluids, or highly volatile oil, and facilitating its combustion by lamps or other illuminating apparatus through the agency of a capillary vaporizer, which drawing the oil or spirit from the wick or lower part of the lamp vaporizes it by its own conserved heat, and presents it in a gaseous form to the burner through the perforations of which it has to pass to be externally inflamed.

A.D. 1875, February 26.—No. 716.

ROMANES, John, of Worthing, in the county of Sussex.—" Improvements in roller skates."

The invention consists in mounting at each end of the skate a roller, and in the centre of the skate on a transverse line a pair of rollers of smaller diameter, the axis of such pair of rollers being carried by a spring; so that, when running in straight lines, all four wheels bear on the ground; but, when the weight of the skater is thrown onto one side of the skate, the two large wheels and one of the smaller wheels bear on the floor, the second smaller wheel being raised from the ground.

A.D. 1875, February 26.—No. 717.

DERIGNY, Eugène, of Mortimer Street, Cavendish Square, and **TALLON**, Edouard, of Oxford Street, both in the county of Middlesex.—" Improvements in nails to be employed in the manufacture " of boots and shoes, and an improved instrument to be employed to pierce the holes for such nails."

The heads of the nails are made much stronger than the shanks, and the length of the shank is notched or cut in the sides in order to retain them firmly in the leather.

The instrument employed to pierce holes for the nails is made of any suitable length, and has at its acting head the diameter of the length of the nail heads, and has the form of the head of the nail.

A.D. 1875, February 26.—No. 718.

BLOCK, George Emanuel, of 104, Marylebone Road, Baker Street, in the county of Middlesex.— " Improvements in the manufacture of artificial leather or cloth."

According to this Provisional Specification a thin sheet of cork is coated on both sides with japanned cloth, canvas, thin leather, or such like fabric, the fabrics and cork being united together by skins or membranes of india rubber, which will stretch or bend in any direction and yet always return to its original form without breaking.

A.D. 1875, February 26.—No. 719.

WALKER, Benjamin, and **PFLAUM**, John Frederick Augustus, engineers, both of Leeds, in the county of York.—" Improvements in hydraulic machinery."

This Provisional Specification describes passing the chain which is attached to the hydraulic ram over a guide pulley, and so to a skeleton pulley or drum, which is so constructed that its effective diameter, or its diameter where the chain takes its bearing, can be increased or diminished at pleasure. If the loads with which the crane is working be light, the skeleton drawn is so adjusted as to have a large effective diameter, and the traverse of the ram will then be short by comparison with the lift of the load. On the other hand if the loads be heavy, the skeleton drum is adjusted to a small effective diameter, and then the ram will traverse over a longer distance. In some cases the same economy is attained without the use of a skeleton drum by the use of two cylinders and rams. Improvements in Bessemer ingot cranes are also described.

A.D. 1875, February 26.—No. 720.

CATLOW, Samuel, cotton spinner, **BLACKBURN**, Blackburn, mule overlooker, and **PARKINSON**, Robert, mechanic, all of Colne, in the county of Lancaster.—" Improvements in spinning mules or " machinery for spinning cotton or other fibrous substances."

This relates to the " mangle-wheel-mule," the object being to produce a better cop. We effect this by having the ordinary quadrant rail, which heretofore has been a fixture, so constructed or applied

A.D. 1875, February 27.—No. 725.

SHANKS, Henry, of Glasgow, in the county of Lanark, North Britain.—"Improvements in winding "or spooling threads or yarns, and in the machinery employed therefor."

The features of novelty which constitute this invention are:

First. Winding or spooling the thread or yarn into the form set forth.

Second. The arrangement or construction of the mechanism, and particularly that for producing the varying motion of the building rod.

A.D. 1875, February 27.—No. 726.

PITCHFORD, Walter Francis, of Belsize Square, in the county of Middlesex, gentleman.—"Improvements in dissolving gums."

The essential points of this invention relates to improvements in dissolving gum copal and other hard gums and consists in treating such hard gums with fusel oil or with such derivatives of the same as may be solvents of the gums to be operated upon.

The fusel oil or the derivatives of the same may be applied to the gum in any convenient manner, but I find in practice that the gums should be reduced to tolerably fine proportions and when the fusel oil or any of the derivatives of the same are applied thereto and the gums and fusel oil or the derivatives of the same are kept in a state of agitation the gums are then readily dissolved.

A.D. 1875, February 27.—No. 727.

BRADFORD, Thomas, of High Holborn, in the county of Middlesex, and of the city of Manchester, laundry engineer.—"Improvements in machinery or apparatus for cutting, reducing and pulverizing "bones for various useful purposes."

A suitable framing supports a bed plate, in the centre of which a circular metal disc (carried by bearings cast on the bed plate) rotates at right angles thereto.

One side of this disc carries a series of steel cutting plates with the cutting edge set off from the surface of the disc at any suitable acute angle; the face of the disc forms a guage plate.

In other than domestic machines the cut of the cutters may be made adjustable; to allow of this I recess the guage face of the disc in front of each of the cutting plates, and place in each of the recesses an adjustable guage plate.

Rotary motion is imparted to the disc and cutters by means of any suitable mechanism.

Immediately in front and in line with the bevil or cutting edge of each cutting plate and to prevent the same getting blocked with loose or compressed pieces of bone, I make a bevilled slot or opening in the disc through which any wedged piece is forced by the succeeding piece cut by the same cutter.

Above the bedplate and at the cutting side of the disc I place a metal hopper for holding the bone in position for being cut.

For the more effectual reduction of the bone I place underneath the bedplate a series of corrugated rollers, the corrugations of which are cleared from any bone which may get compressed therein by suitable steel plates.

The bone is fed to these rollers after being cut through a second hopper.

I also propose to make the cutting apparatus and the pulverizing apparatus as separate machines when so required.

A.D. 1875, February 27.—No. 728.

COOPER, Alfred, of Kingsley Street, Battersea, in the county of Surrey.—"Improvements in "bankers' cheques or drafts, also applicable to other cheques, tallies, tickets, and labels."

This invention relates to cheques used in that description of banking wherein a depositor receives in exchange for a certain sum deposited a number of cheques each marked with a definite money value, the aggregate value of all the cheques being equal to the sum deposited. According to the present invention such cheques are each marked with a definite value in one corner in the manner of a coupon, and if the depositor desires to issue a cheque for an amount greater than the value marked thereon, he detaches the corner or corners marked with the money value from one or more of the other cheques and attaches the same to the first named cheque. Or a foil impressed with a number of separate money values in the manner of coupons, is issued with the cheques and the depositor detaches one or more coupons from the foil and attaches the same to the cheque of which he wishes to increase the value. Or two or more cheques are formed into one sheet of paper and are grouped so as to have a number of coupons common to all, so that any one cheque can be detached with any number of the coupons adhering thereto.

The improvements are also applicable to cheques other than bankers' cheques, tallies, labels, &c.

A.D. 1875, February 27.—No. 729.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Jacques Viglino, engineer, and Jacques Donna, solicitor, both of Turin, Italy.*)—" Improvements in axles " for railway waggons, to be called the Viglino axles."

This invention consists in applying to the journal or axle bearing of railway carriage axles which when axle worn can be removed and a new one substituted the axle body itself therefore is protected from any wear.

A.D. 1875, February 27.—No. 730.

CURRALL, John, of Birmingham, in the county of Warwick, manager of works.—" Improvements " in apparatus to be applied to windows, doors, walls, and roofs, for ventilating rooms and buildings."

This invention consists of arrangements of openings either in the window sashes or sash frame, which openings by the positions of the sashes are covered or uncovered, and the ingress of fresh air and the egress of vitiated air permitted or prevented at pleasure. Also applying similar arrangements to doors in combination with sliding or hinged plates for covering or uncovering the air openings. Also adapting to ceilings and roofs an arrangement for permitting of the escape of vitiated air at the ridge tiles; and further, an arrangement of ventilator for chimneys or flues and walls, in which the exit passage is small compared with the entrance passage.

A.D. 1875, February 27.—No. 731.

HALL, John, of Chacewater, in the county of Cornwall.—" Improved means for discharging calcined " ores from the furnace, or crushed ores from other sources, and for washing and separating such " ores."

The calcined ore falling from the furnace is first sifted and the finer portions conducted through a tube by means of a screw conveyor into a wetting chamber, where it is cooled by a stream of water. The mixture of ore and water next passes to a separator, the fine ore being conducted to the buddle and the larger portions to be restamped, as are also the lumps rejected in the first sifting.

A.D. 1875, February 27.—No. 732.

VAN GELDER, Pieter, of Vryenban, near Delft, in the Kingdom of Holland, at present residing at Sefton Street, Litherland, in the county of Lancashire.—" Sundry improvements in apparatus for " removing smut from wheat, and for the better cleaning of wheat and other grains."

This Provisional Specification describes an apparatus consisting of a frame supporting a hollow cylinder of natural or artificial stone. Within this cylinder revolves on a vertical spindle a hollow drum made of iron or steel plate or wire; the grain is admitted in the space between the outside of the drum and the inside of the stone cylinder, and is introduced at the top of this space.

A horizontal fan or ventilator fixed on the same vertical spindle supplies a strong air draught, which is conveyed through a tube or tubes to the bottom of the space between the cylinder and the drum.

The inside of the cylinder is provided with helicoidal grooves.

A.D. 1875, February 27.—No. 733.

WALKER, Robert Stocks, of 169, Gresham House, in the city of London.—" Improvements in marine " and other steam boilers."

This Provisional Specification describes a boiler consisting of a cylindrical shell made in sections bolted together. Within the shell are series of cylindrical boxes, one over the other; they are connected together by short junction pieces. The lower box contains the furnace, and those above it vertical water tubes.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 21 to August 27, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, March 1.—No. 746.

WHITE, John, of 166, Fleet Street, in the city of London.—" Improvements in the manufacture of " chromates of potash and soda and their bichromates."

This consists in slaking lime with sulphate of potash *in solution*, and adding chrome ore to this mixture.

A.D. 1875, March 2.—No. 752.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Henry Harrison Doty, of* 13, *Rue Gaillon, Paris, gentleman.*)—" Improvements in lamps for signalling " for railways, for ships, and for other purposes."

This invention describes a lamp for signalling with sliding colored glasses or lenses or a reflector, when required to be controlled the light is thrown upon two different points.

A.D. 1875, March 2.—No. 763.

WOLVERSON, Edwin, of Birmingham, in the county of Warwick, machinist.—" Improvements in " corkscrews, which improvements are also applicable to screw-passers, augers, screw-drivers, and " other similar hand tools."

According to this invention the cross handle of the corkscrew is loose and works between two collars on the stem of the worm. The opposed faces of these collars are made into toothed ratchets, with one or the other of which ratchets a corresponding ratchet on the upper or lower face of the handle may be engaged, and when engaged a backward and forward twisting motion of the handle gives rotation to the stem, and causes the worm either to advance in or be withdrawn from the cork, the motion of the worm being effected without loosing the handle.

The arrangement of parts described may be applied to screw-passers, augers, screw-drivers, and other similar hand tools which in use have a rotary motion communicated to them.

A.D. 1875, March 3.—No. 772.

GROVER, John William, of No. 9, Victoria Chambers, Westminster, in the county of Middlesex.— " Improvements in the manufacture of spring washers, and apparatus therefor."

This invention relates to the manufacture of spring or elastic washers such as were described in the Specon. to a Patent granted to the said J. W. Grover on the 3rd April 1873, No. 1230.

According to this invention a piece of metal rod cut to length with bevilled ends is inserted between a mandril and the edge of a disc and between two helical faces which are pressed together by a screw, and the disc being then made to revolve round the mandril, the piece of rod is coiled into the form of a helical washer, which drops out of the machine on relieving the side pressure.

A.D. 1875, March 3.—No. 786.

SUGG, William Thomas, Vincent Works, Vincent Street, in the city of Westminster.—"Improvements in lamp burners."

This invention relates to paraffin oil burners, and consists, firstly, in making the wick holder or upper part thereof of porcelain, steatite, glass, or other non heat conducting material, or of making slits on the upper part of the wick case, or of severing the wick tubes and joining them together by wires, leaving an intervening space between the upper and lower part of the wick holder.

Secondly, in surrounding the wick holder with a case or gallery wherein perforations are made, and so arranged that while one current of air passes to the flame through the central tube, another passes up outside the wick case and between it and the cone to the exterior of the flame. In addition to these currents, by the attachment of an upper gallery, another current of air is induced to pass up outside the cone and between it and the chimney.

By the adoption of these improvements a greatly increased light will be the result.

A.D. 1875, March 4.—No. 795.

ROBINSON, Richard Cardwell, of No. 1, Avenham Terrace, Preston, in the county of Lancaster, ironfounder.—"Improvements in the mode of and apparatus for manufacturing socketted pipes from clay or other plastic material."

This invention consists first in the employment of the elastic force of the air displaced and compressed in the die or mould by the entering clay, for the purpose of assisting in the removal of the socket part of the pipe from the die, and secondly in the application and use for this purpose of wire netting in conjunction with wire gauze for the lining of the die.

A.D. 1875, March 4.—No. 799.

BELL, Henry, of Birmingham, in the county of Warwick, pin and rivet manufacturer.—"Improvements in machinery for the manufacture of nails and tacks."

This invention consists of mechanism for turning over the nail plate or strip carried by the inclined feeding tube and at the same time lifting the nose end of the feeding tube from the lower cutter. The alternating semi-rotation of the feeding tube is produced by a worm and worm wheel, the latter being driven by a rocking shaft from the main shaft of the machine; and the lifting of the nose end of the feeding tube is effected by toothed gearing and a cam bearing against a collar on the feeding tube. The feeding mechanism is carried by an adjustable support in front of the machine.

A.D. 1875, March 5.—No. 820.

WISE, William Lloyd, of Chandos Chambers, Buckingham Street, Adelphi, in the county of Middlesex.—(*A communication from Ernest Solvay, of Brussels, in the Kingdom of Belgium, manufacturer.*)—"An improved continuous horizontal apparatus for washing or absorbing gas or vapours, or for distilling liquids."

The apparatus consists in a closed tank or reservoir divided into compartments which communicate one with the other by holes or apertures made in the partitions, the lower holes being for the passage of the liquid, and the upper holes for the passage of the gas or vapour from one end of the apparatus to the other. Over each of the holes for the passage of the liquid into the inner compartments is affixed a tube or pipe bent upwards and rising vertically to rather above the intended level of the liquid. And over each of the holes for the passage of gas or vapour into the inner compartments is affixed a gas or steam tube or pipe of less diameter than the liquid pipes above referred to, and the said gas or steam tubes or pipes extend downwards, and by their lower ends, which are serrated, dip into the liquid pipes respectively, being concentric thereto.

The liquid is fed into the apparatus from a separate feed tank, in which the liquid is kept constantly at the required level by a float and suitable valve. The said liquid passes from the feed tank into the apparatus and consecutively through each of the compartments, by passing into each of the liquid pipes, and being projected therefrom by the action of the steam or gas issuing from the steam or gas pipes.

A.D. 1875, March 8.—No. 846.

KENNARD, Howard John, of No. 67, Upper Thames Street, in the city of London.—" Improvements " in stoves and flue pipes."

This invention relates to the application to stoves and flue pipes of internal ribs or gills exposed to the fire or hot products of combustion to absorb heat, as well as external gills for giving it off. For stoves to be used as open fires or as close stoves, a blower or front is made with hooks to be hung on as a trivet with an air valve in its lower part.

A.D. 1875, March 11.—No. 903.

McLEOD, Frederick Hicks, of the city of Glasgow, in the county of Lanark, North Britain, wool broker.—" An improved composition to be applied to sheep and other animals for destroying vermin " thereon, and for protecting them therefrom."

The novelty of this invention consists in the employment of the following ingredients, and in about the proportions given for the production of a composition or " dip " for destroying vermin on sheep, and for protecting them therefrom; viz., about—

21 parts, by weight, of tallow or other fatty or saponifiable substance.
24 parts of light tar oil.
10 parts of yellow tar oil.
29 parts of alkaline " lye," caustic soda, or caustic potash.
8 parts of rozin.
5 parts of carbolic acid, and
3 parts of cresylic acid.

A.D. 1875, April 21.—No. 1445.

RUSSELL, WILLIAM, of Lydbrook, in the county of Gloucester, Iron master.—" A new or an improved method of and a furnace for melting brass and cast iron and other metals."

This furnace is a much quicker and better mode of melting brass and cast iron than that at present adopted and in use. The same constructed on the scale of the accompanying plans will melt from one hundred to one hundred and twelve pounds.

A.D. 1875, June 12.—No. 2153.

LOFTS, Ezra, of Cambridge, in the county of Cambridge.—" A new or improved apparatus for " checking the receipts and payments of monies in shops and other similar places, and for the " detection of negligence, errors, and thefts in such receipts and payments."

The features of novelty in this case consist in checking the receipts and payments of monies in shops and the like places by mounting on a revolving rim or hoop a number of strips of writing paper, on which the several amounts of money dealt with are recorded in succession by the operator; the said revolving rim is mounted on or attached to a toothed wheel inside a box, which wheel is operated by a screw fitted on an axle, the said axle being turned by a handle outside the box, which handle also secures and liberates the till door; the same operation also rings or strikes an alarm bell within the box, and passes the recorded amount of money dealt with beyond the power of the operator to alter or deface it.

A.D. 1875, August 23.—No. 2953.

KING, Nelson, of Hartford, Connecticut, United States of America, gun maker.—" Improvements in " breech loading fire arms."

This invention is an improvement particularly adapted to the breech-loading " sharps rifle." A bar or bolt is set in an oblique slot in the side of the vertically moving gate or slide, which closes and encloses the breech end of the barrel, having limited play therein. This bar or bolt is cam pointed, and when the gate is moved down is pressed back, and pressing back presses on the face of the hammer and throws the hammer back till it catches in the " safety notch." The hammer is similarly set back to the " safety notch " when the gate moves up, if by chance the hammer be then down. A modification is shown, when the bolt or bar is combined with the cartridge extractor.

A.D. 1875, August 26.—No. 2997.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Richard Powell, of Washington, in the District of Columbia, United States of America.*)—"Improvements in constructing iron ships or vessels."

The objects of this invention are, first, an improved plan of constructing the hulls of iron vessels so as to have a fair and smooth outside surface; second, to secure wood backing or filling for the reception of wood planking to be covered with copper sheathing, so that none of the fastenings will pass through or penetrate the outer iron plating or skin of the vessel, particularly in the portion to be immersed; third, to lessen the rolling motion of iron vessels with advantage to their speed, steering, &c.

INDEX OF NAMES

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[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 36 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 9 with the weekly Nos. of the Index for the present year.]

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[magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish-
[ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 5,
[Filling and corking bottles.
Bradford, T., 727, Feb. 27, Cutting, reducing and pul-
[verizing bones, &c.
Bradley, C., & Campbell, J., 480, Feb. 9, Combing fibres.
—— G., & Madderson, T., 63, Jan. 7, Crushing
[stones, &c.
Bradley, J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining
[powder.
Briebach, J. A., 313, Jan. 27, Indicating position of
[rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
—— J., F. W. & W. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
—— W. W., J. & F. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal
[apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Broadfoot, J., 507, Feb. 11, Waterclosets.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P.,
[76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking
[apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, H., 475, Feb. 9, Inkstands.
—— H., 476. Feb. 9, Call or signal bell apparatus.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing
[electro-type shells.
Brown, J., 549, Feb. 15, Confectionery.
—— J., 714, Feb. 26, Copper plates for printing, &c.
—— J. F., & Baird, J., 258, Jan. 23, Weaving.
—— J. W., & Allan, G., 525, Feb. 12, Electric telegraphs.
—— M. H., 352, Jan. 30, Fire guards.
—— N., 538, Feb. 13, Weighing-machines.
—— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and
[windows.
—— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.
—— W. Morgan- (*Donna & Viglino*), 626, Feb. 20,
[Motive-power engines.
—— W. Morgan- (*Verdier*), 654, Feb. 23, Treating peat.
—— W. Morgan- (*Doty*), 752, Mar. 2 (*App.* 9.) Lamps.
—— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 48.)
[Boiler anti-incrustation battery.
—— W. Morgan- (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of type.
—— W. Morgan- (*Johnson & Harding*), 2250, June 15
[(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12,
[Converting iron scraps, &c. into steel.
—— A. (*Fletcher*), 578, Feb. 17, Screw propellers.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.

Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29,
[Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.)
[Vapor and gas-engines.
Brunner, W. G. (*Schnabel & Henning*), 505, Feb. 11,
[Portable cranes.
Brunton, J. D., 702, Feb. 25, Dressing, &c. stone.
Buchanan, T. R. (*Studwell*), 628, Feb. 30, Economising
[fuel, &c. in steam-boilers.
Buckley, J. B., & Stock, E., 378, Feb. 2, Stench traps.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning
bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Bürgin, E. (Jensen), 506, Feb. 11, Increasing the adhe-
[sion of locomotive wheels on rails.
Burling, E. T., 616, Feb. 19, Pianofortes.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway car-
[riages; tyres.
Bury, S., 465, Feb. 8, Self-acting temples.
Bustin, R. (Lake), 185, Jan. 18, Hanging wall papers.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18, Casks.
—— T., & Thornley, G., 1518, Apr. 26 (*App.* 44.)
[Jointing cask staves.
Byron, G. G. de L. (*Godley*), 550, Feb. 15, Carriage springs.

C.

Cadogan, Hon. G., 328, Jan. 28, Apparatus for igniting
[and holding matches.
Caithness, Earl of, 703, Feb. 25, Cleaning railway rolling
[stock, &c.
Calley, S., & Share, H. H., 377, Feb. 2, Raising, &c. boats.
Calverley, J., & MacDonald, J. C., 611, Feb. 19, Printing
[presses.
Cameron, A. S., 429, Feb. 4, Steam-engines.
—— P., 604, Feb. 19, Convertible desks and seats.
Campbell, J., & Bradley, C., 480, Feb. 9, Combing fibres.
Cannon, W. G., 294, Jan. 26, Cup and ball joint for gas
[pendants, &c.
Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casalogna, D. A. (*Janiot*), 591, Feb. 18, Printing presses.
Casson, T., 123, Jan. 13, Hydraulic engines.
Caswell, S., 632, Feb. 20, Railway breaks.
Catchpole, J. L., & Stidolph, G. F. & T. F., 612, Feb. 19,
[Cleaning seed.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
—— S. Blackburn, B., & Parkinson, R., 720, Feb. 26,
[Spinning mules.
Cave, J. O'C., 140, Jan. 14, Aërial navigation.
—— J. O'C., 141, Jan. 14, Governor, steam gauge,
[safety valve, &c.
—— J. O'C., 571, Feb. 17, Rest for knives, forks and
[spoons.
—— J. O'C., 646, Feb. 22, Torpedoes.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chambers, W. H., 682, Feb. 24, Receptacle for storing
[and carrying explosives, &c.
Chameroy, E. A., 417, Feb. 4, Cocks for water, steam, &c.
—— E. A., 828, Mar. 6 (*App.* 6.) Weighing machines.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H.
(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing
[machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket
[eyes on tools.
Chaquette, E., 416, Feb. 4, Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas,
parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from
[fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Chivers, A. & S., 349, Jan. 29, Concentrating sulphuric
[acid.
—— S. & A., 349, Jan. 29, Concentrating sulphuric
[acid.
Chomel, J. A., 659, Feb. 23, Suspending things in equipoise.
Chubb, G. H., 653, Feb. 22, Connecting railway rails.
Clark, A. (*Dows*), 544, Feb. 15, Treadle apparatus.
—— A. M. (*Portait & Weber*), 28, Jan. 2, Preparing
[fibres for spinning.
—— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
—— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of
[light and heat.
—— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
—— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting
[hats, &c.
—— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial
[apparatus.
—— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for
[nut blanks.
—— A. M. (*Eyquem*), 256, Jan. 22, Steel.
—— A. M. (*Rogé, Poret, Baffoy, & Dupré*), 288,
[Jan. 25, Preserving woven fabrics.
—— A. M. (*Robinson*), 338, Jan. 28, Feeding and
[burning oils in furnaces.
—— A. M. (*Maxwell-Lyte*), 563, Feb. 16, Ammonia.
—— A. M. (*Guérin*), 707, Feb. 26, Enlarging and re-
[ducing designs, &c.
—— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.)
[Pumps.
—— A. M. (*Porter*), 1042, Mar. 22 (*App.* 7.) Screw
[propellers.
—— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery
[and handles.
—— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
—— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking
[screw nuts.
—— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.*
[46.) Hydraulic engines, &c.
—— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway
[for warehouses.
—— A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
—— A. M. (*Lodge*), 2520, July 13 (*App.* 3.), Fulling mills.
—— A. M. (*Powell*), 2997, Aug. 26 (*App.* 9.) Iron ships.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— J. L., & Standfield, J., 514, Feb. 11, Floating docks
[and pontoons.
—— W., 80, Jan. 9, Railway breaks.
—— W. (*Malo*), 404, Feb. 3, Ships or vessels.
—— W. (*Legat*), 463, Feb. 6, Sewing straw hats, &c.
—— W. (*Lontin*), 473, Feb. 8, Application of electro-
[dynamic machines.
—— W. (*Rousseau*), 2657, July 27 (*App.* 5.) Railway
[signalling.
—— W. (*Rousseau*), 2740, Aug. 4 (*App.* 6.) Railway
[Signalling.
Clarke, S. & S. B., 685. Feb. 24, Night lights.
—— S. B. & S., 685, Feb. 24, Night lights.
—— T. A. W., Corah, E., & Cooper, J. H., 470, Feb. 8,
[Knitting machines.
Clay, T., & Schulz, J. J., 701, Feb. 25, Tension me-
[chanism for warp beams.
Clayton, A., & Sinclair, J., 629, Feb. 20, Sweeping and
[rolling machines.
—— J., Whittaker, T., & Duxbury, J., 73, Jan. 8,
[Bricks, tiles, &c.

Clements, J. M., 367, Feb. 1, Sewing-machines.
Cleveland Paper Box Machine Co. (Haseltine), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
Clinker, C., 513, Feb. 11, Printing machines.
Clough, W. R. (Haseltine), 1640, May 3 (*App.*45.) Cork- [screws.
Coales, S. L., 334, Jan. 28, Coiling and uncoiling hose [pipes.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.*40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and [windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
—— F., 698, Feb. 25, Hanging and fastening sashes, [doors, &c.
—— S., 495, Feb. 10, Compositions for inkstands, picture- [frames, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers [and other boilers.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Connell, A., 302, Jan. 26, Wagons.
Coombe, J. C., 287, Jan. 25, Blacking.
Cooper, A., 728, Feb. 27, Bankers' cheques, &c.
—— J. H., Clarke, T. A. W., & Corah, E., 470, Feb. 8, [Knitting machines.
Cooper, W. S. (Storer), 693, Feb. 25, Waterclosets.
Cooper, W. S. (Storer), 693, Feb. 20, Waterclosets.
Constant, J. (Johnson), 301, Jan. 26, Connecting tubes [to tube plates.
Corah, E., Cooper, J. H., & Clarke, T. A. W., 470, Feb. 8, [Knitting machines.
Cordillot, H. F. A., & Mather, W., 479, Feb. 9, Steaming [printed fabrics.
Cornely, E. (Gedge), 306, Jan. 27, Edging machines.
Cornish, H. M. (*Cornish*), 577, Feb. 17, Mattresses, life [buoys, &c.
Cornish, T. (Cornish), 577, Feb. 17, Mattresses, life [buoys, &c.
Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cottrill, S., 414, Feb. 4, Railway signals.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, J., 723, Feb. 26, Preparing fertilisers.
—— W., 642, Feb. 22, Compressing yarn.
—— W., & Howard, J., 277, Jan. 25, Saddle girth [tightener.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
—— A. H., 374, Feb. 1, Marking and cutting textile [materials.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy- [menageries.
Cranston, W. McI. (*Scott*), 677, Feb. 24, Portable lathes [for dentists and jewellers.
Crawley, W., 517, Feb. 12, Ships.
Crocker, S.L., 778, Mar. 3 (*App.* 36.) Smelting copper ores.
Cromby, E. E., 425, Feb. 4, Dry gas meters.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.*49.) [Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
—— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Crosland, W., & Salmon, J., 581, Feb. 17, Grinding and [polishing stones.
Cuivre Français, Société Anonyme du (Bousfield), 2042, [June 30 (*App.* 49.) Protosulphuret of iron [and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.*50.) Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs; locking nuts.
Currall, J., 730, Feb. 27, Ventilating buildings.
Cutler, W., 601, Feb. 18, Fermenting vats, &c.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J.T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary [vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti- [lating water-closets, &c.
Dauner, J. L. (Dufrené), 438, Feb. 5, Horse collars.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Daw, M. W., 496, Feb. 10, Scissors.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
—— H., 332, Jan. 28, Chlorine.
—— H., 906, Mar. 11 (*App.* 8.) Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or [aërial apparatus.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving [life at sea.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c. [machines.
Derigny, E., & Tallon, E., 717, Feb. 26, Boot nails, &c.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.) [Sewing machines.
Devenport, C., 483, Feb. 9, Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308, [Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308, [Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and [stuffing box.
Dignum, F. B., 515, Feb. 12, Breakers or water casks [for boats.
Dix, A. M., 203, Jan. 19, Axles for waggons, &c.
Dixon, G., Maddox, J., Gardner, E., & Hughes, T., 367, Feb. 16, Fringes.
Dixwell, G. B., 1012, Mar. 19 (*App.* 38.) Steam-engines.
—— G. B., 2934, Aug. 20 (*App.* 8.) Steam-engines.
Dolne, L., 534, Feb. 13, Revolvers.
Dominy, G., & Russell, J., 398, Feb. 3, Guards for [carving forks.
Donald, J., 532, Feb. 13, Stoking apparatus for furnaces.
Donna, J., & Viglino, J. (Morgan-Brown), 626, Feb. 20, [Motive-power machines.
—— *J., & Viglino, J.* (Morgan-Brown), 729, Feb. 27, [Railway axles.
Doolittle, T. B., 1434, Apr. 12 (*App.* 43.) Alarm registers.
Dorat, H. J. (*Grave*), 210, Jan. 20, Gas burners, &c.
Doty, H. H. (Morgan-Brown), 752, Mar. 2 (*App.* 9.) [Lamps.
Douglas, W. H., 348, Jan. 29, Sewing machines.
Doulton, J., 365, Jan. 30, Stoves.
Dows, G. D. (Clark), 544, Feb. 15, Treadle apparatus.
Dudgeon, A., 33, Jan. 4, Distilling.
Dufour, F. V. (Gedge), 20, Jan. 2, Agricultural machine.
Dufrene, H. A. (*Lévèque*), 195, Jan. 19, Railway sleepers.
—— H. A. (*Dauner*), 438, Feb. 5, Horse collars.
Dumont, A., & Alfieri, E., 512, Feb. 11, Lockets.
Dupré, P. S. E., Rogé, H. N., Poret, E., & Baffoy, P. H. [(Clark), 288, Jan. 25, Preserving woven fabrics.
Durand, F., & Marais, E. L., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.
Duxbury, J., Clayton, J., & Whittaker, T., 73, Jan. 8, [Bricks, tiles, &c.

E.

Eaton, L., 1945, May 27 (*App.* 48.) Chronometers, &c.
Edge, W. (Clark), 1615, May 1 (*App.* 45.) Chain swivels.
Edison, T. A., 384, Feb. 2, Telegraphs.

Girdwood, H. M., 568, Feb. 17, Spinning.
Gledhill, G. & W., 179, Jan. 16, Railway signalling.
——— W. & G., 179, Jan. 16, Railway signalling.
Godley, G. (Byron), 550, Feb. 15, Carriage springs.
Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.
Goodwin, W., 559, Feb. 16, Facilitating conveyance, &c. [of substances.
Goudie, J. T., 712, Feb. 26, Life-saving garment.
Gouverneur, H.G.,452, Feb. 6, Reeds for harmoniums, &c.
——— H. G., 453, Feb. 6, Reeds for harmoniums, &c.
Graham, J. C., 202, Jan. 19, Steam-boilers.
Granville, A., & Timmis, I. A., 643, Feb. 22, Treating [hides, skins, &c.
Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.
Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans- [mitting musical vibrations, &c.
Green, J., 44, Jan. 5, Fuel economiser for fire-grates.
—— W., 129, Jan. 13, Soaps.
Greenwood, F. A., 467, Feb. 8, Spinning.
Greig, D., & Eyth, M., 663, Feb. 23, Engines.
Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.
Grosclaude, L. A. (Weill & Harburg), 528, Feb. 12, [Musical boxes, &c.
Grover, J. W., 772, Mar. 3 (*App.* 9.) Spring washers.
Gudgeon, W., 582, Feb. 17, Preparing fibres.
Guérin, V. (Clark), 707, Feb. 26, Enlarging and reducing [designs, &c.
Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2, [Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.
Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.
Haddan, J. C., & Smith, H., 412, Feb. 4, Carving forks.
Haggas, W., 285, Jan. 25, Looms.
Hahn, I. (Imray), 2903, Aug. 18 (*App.* 8.) Rolling mills.
Hainsworth, M., 239, Jan. 21, Extinguishing fires.
Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.
Hall, D. & J., 428, Feb. 4, Temples for looms.
—— James, 346, Jan. 29, Lime and cement kilns.
—— James & D., 428, Feb. 4, Temples for looms.
—— John, 731, Feb. 27, Discharging ores, &c.
—— W. J., Marshall, F. A., & Skinner, C. W., 530, [Feb. 13, Feed heaters for boilers.
Hallett, B., & Rood, G. A., 630, Feb. 20, Bicycles.
——— G., & Lester, H. E., 36, Jan. 4, Lowering boats.
Halley, G., 444, Feb. 5, Nut blanks.
Hallsworth, S., & Bailes, R., 573, Feb. 17, Treating sewage.
Hamburg-American Sewing-Machine Co. (Jensen), 26, [Jan. 2, Printing metals.
Handyside, H., 376, Feb. 2, Chains or cables.
Harburg, H., Weill, L., (*Grosclaude*), 528, Feb. 12, [Musical boxes, &c.
Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250, [June 19 (*App.* 52) Tramway rolling stock.
Hardy, T. E. (*Minns*), 687, Feb. 25, Artificial leather.
Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.
——— J., 147, Jan. 14, Sulphates.
Harper, R. R., 336, Jan. 28, Electric telegraph apparatus.
Harris, C., & Fyfe, A. L., 405, Feb. 3, Dress improvers.
Harrison, C., 363, Jan. 30, Umbrella runners.
Harrison, G.W. (*Lake*), 2774, Aug. 5 (*App.* 6.) Harvesters.
——— S. L., 461, Feb. 6, Axles for railway cars.
Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.* [36.) Pumps.
Harvey, J., 222, Jan. 20, Two-wheeled carriages.
Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.
——— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.
——— G. (*Bradford & Ferry*), 484, Feb. 9, Filling [and corking bottles.
——— G. (*Winchester & Phelps*), 485, Feb. 9, Rock [drills.
——— G. (*Keene & Sawyer*), 700, Feb. 25, Surfaces [for steps, &c.
——— G. (*Cleveland Paper Box Machine Co.*), 1008, [Mar. 18 (*App.* 38.) Paper boxes.
——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009, [Mar. 18 (*App.* 38.) Wood-planing machines.
——— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning [bricks, &c.
——— G. (*Young*) 1317, Apr. 10 (*App.* 42.) Cutting [match splints.
——— G. (*Sutro*), 1479, Apr. 22 (*App.* 43.) Device [for holding thread, &c.
——— G. (*Clough*), 1640, May 3 (*App.* 45.) Cork- [screws.
——— G. (*Edson & Silliman*), 1677, May 5 (*App.* 45.) [Paddle wheels.
——— G. (*Lyman*) 1781, May 13 (*App.* 46.) Thread [spools, pail-handles, &c.
——— G. (*Kitson*), 2433, July 5 (*App.* 2.) Opening [cotton.
Haskell, A. G., 2662, July 27 (*App.* 5.) Life-preserving [bed.
Hayward, G., Knap, C., & Taunton R. H., 208, Jan. 19, [Wrought iron tubes.
——— P., & Middleton, W., 493, Feb. 10, Melting, [&c. metals.
Heape, R. T., 117, Jan. 12, Carding engines.
Heard, J. R., 489, Feb. 10, Horse-shoe and other nails.
Heaton, D. (Bousfield), 18, Jan. 1, Button fasteners.
Heberlein, J. (Imray), 676, Feb. 24, Railway breaks.
Henning & Schnabel (Brunner), 505, Feb. 11, Portable [cranes.
Henriot, F. P., 675, Feb. 24, Indicating water level in [boilers.
Henson, H. H., 575, Feb. 17, Paving.
Hesling, J., 548, Feb. 15, Fulling or milling.
Hessel, C. (*Pregardan*), 1636, May 3 (*App.* 45.) Steam- [boilers.
Hewitt, J. B., 182, Jan. 16, Pole-axe.
Hey, J. E., & Hill, J., 362, Jan. 30, Ventilators.
Hickisson, J., 557, Feb. 16, Exhibiting articles for sale.
Higgins, F., & Theiler, R., 423, Feb. 4, "Tell tale" [clocks.
Higginson, A., 108, Jan. 12, Motive-power engines and [pumps.
Hildebrandt, A. (*Niemann & Geiger*), 316, Jan. 27, Tram- [ways.
Hill, J., & Hey, J. E., 362, Jan. 30, Ventilators.
Hirsch, J. (*Hirsch*), 576, Feb. 17, Screw propellers.
Hirsch, M. (Hirsch), 576, Feb. 17, Screw propellers.
Hobbs, A. C., & Orcutt, J. (Brookes), 125, Jan. 13, [Cartridges.
Hodson, C., 371, Feb. 1, Floor, sash, and bench cramp.
Holding, J., & Collier, J., 19, Jan. 2, Domestic coppers [and other boilers.
Holland, R., 393, Feb. 3, Fastening wheel tyres.
——— W., & *Myers, H.*, 34, Jan. 4, Umbrellas and [parasols.
Hollerbusch, M. (Flachfeld), 440, Feb. 5, Pencils.
Holliday, T. (*Schultz*), 498, Feb. 10, Printing fabrics.
——— T. (*Schultz*), 499, Feb. 10, Bleaching fabrics.
Holmes, J. E., & Payton, W., 343, Jan. 29, Sawing [machinery.
Holmes, R. R., 122, Jan. 13, Aërated liquors.
Holroyde, W. J., 469, Feb. 8, Dredger grapples.
Holt, C. H., & Galloway, C. J., 2514, July 13 (*App.* 3.) [Steam-boilers.

Holt, T. (Ibbotson), 638, Feb. 20, Grate bars.
Hope-Vere, C. E., 183, Jan. 18, Cleansing china and other [articles.
Hough, J. E., Rimington, J. McN., Shepherd, E., & [Rothwell, F. & T., 350, Jan. 29, Sewing-[machines.
Howard, J., & Cox, W., 277, Jan. 25, Saddle girth [tighteners.
Howarth, A. & W., 322, Jan. 28, Dental lathes, &c.
——— J., 240, Jan. 21, Hot-air stoves.
——— W. & A., 322, Jan. 28, Dental lathes, &c.
Howat, A., 580, Feb. 17, Filling, &c. bottles.
Howitt, T., Walker, S., & Gibson, J., 103, Jan. 12, Stop-[pering bottles, &c.
Howland, R., 524, Feb. 12, Combined almanac, pencil [case, &c.
Huet, A. J., & Geyler, A. E. (Johnson), 681, Feb. 24, [Treating gases, liquids, &c.
Hughes, A., 1311, Apr. 10 (*App.* 42.) Reaping and mowing.
——— E. T. (*Parker*), 61, Jan. 6, Claw hammers.
——— H., 372, Feb. 1, Steam-engines.
——— S., & Turner, J., 392, Feb. 3, Lamp burners.
——— T., Dixon, G., Maddox, J., & Gardner, E., 567, [Feb. 16, Fringes.
Humble, W., 149, Jan. 14, Life boats.
Humphreys, G., & Benwell, R. (Alexander), 196, Jan. 19, [Bale bands.
Humphries, G. G., & Hutchinson, T., 397, Feb. 3, Em-[broidering fabrics.
Hunt, B. (*Flagler*), 290, Jan. 26, Welding tubes, &c.
——— E. (*Matthews*), 6, Jan. 1, Musical instruments.
Hussey, C. A. (Clark), 2043, June 3 (*App.* 49.) Electro-[magnetic engines.
Hutchenoe, H., & Rider, F. W., 383, Feb. 2, Harmo-[niums, organs, &c.
Hutchinson, T., & Humphries, G. G., 397, Feb. 3, Em-[broidering fabrics.
——— W. N., 509, Feb. 11, Stirrups.
Huyttens, T. C. M. (Johnson), 445, Feb. 5, Bread.

I.

Ibbotson, H. W. (*Holt*), 638, Feb. 20, Grate bars.
Imlay, C. G. (Lake), 253, Jan. 22, Preventing fraud by [tram-car conductors, &c.
Imray, J. (*Tournier*), 212, Jan. 20, Masticating, &c. food.
——— J. *Heberlein*), 676, Feb. 24, Railway breaks.
——— J. (*Hahn*), 2903, Aug. 18 (*App.* 8.) Rolling mills.
Ingram, J. G., 235, Jan. 21, Washers and packing pieces.
Isherwood, S., & Weare, R., 326, Jan. 28, Carbonaceous [material for filtering, &c.

J.

Jachimovicz, C., & Friedlander, J., 266, Jan. 23, Collect-[ing crops.
Jackson, H., & Milburn, R., 518, Feb. 12, Treating salts, [ores, &c.
Jacob, D., 711, Feb. 26, Distributing manures, &c.
James, B. (Lake), 2089, June 7 (*App.* 50.) Leather-pulp.
James, J., 284, Jan. 25, Railway carriages and wagons.
Janiot, J. B. (Casalogna), 591, Feb. 18, Printing presses.
Jeantaud, C. (Johnson), 651, Feb. 22, Wheels.
Jenkinson, M., 98, Jan. 11, Fastenings for boots, &c.
Jensen, P. (*Hamburg-American Sewing-Machine Co.*) [26, Jan. 2, Printing metals.
——— P. (*Klinkerfues*), 167, Jan. 15, Hygrometers.
——— P. (*Bohlken*), 295, Jan. 26, Washing machine.
Jensen, P. (*Bohlken*), 807, Jan. 27, Earth-boring augers.
——— P. (*Baumotte*), 494, Feb. 10, Painters' easels.
——— P. (*Bürgin*), 506, Feb. 11, Increasing the adhesion [of locomotive wheels on rails.
Jeyes, J., & Turner, C. H., 205, Jan. 19, Lubricator.
Johnson, G. (Clark), 199, Jan. 19, Rolling bars for nut [blanks.
Johnson, J. C., 209, Jan. 20, Forming tube skelps.
——— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening [drills.
——— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer-[ing, &c.
——— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing [fires.
——— J. H. (*Constant*), 301, Jan. 26, Connecting [tubes to tube plates.
——— J. H. (*Adamson*), 381, Feb. 2, Starch, &c.
——— J. H. (*Marot*), 408, Feb. 3, Saccharine solu-[tions.
——— J. H. (*Lamarre*), 409, Feb. 3, Signalling and [illuminating.
——— J. H. (*Huyttens*), 445, Feb. 5, Bread.
——— J. H. (*Oexle*), 561, Feb. 16, Grinding corn, &c.
——— J. H. (*Jeantaud*), 651, Feb. 22, Wheels.
——— J. H. (*Huet & Geyler*), 681, Feb. 24, Treating [gases, liquids, &c.
——— J. H. (*Société Financière de Paris*), 704, Feb. 25, [Treating alunite.
——— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans-[mitting musical vibrations, &c.
——— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
——— *J. R., & Harding, G. P.* (Morgan-Brown) [2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, R., 400, Feb. 3, Obtaining motive-power.
——— S., & Allan, W., 191, Jan. 18, Heating feed [water; condensing steam.
——— S. H., 156, Jan. 14, Cocks or valves.
Joliot, J. P. S., 204, Jan. 19, Railway breaks.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
——— E. A. & J. A., 956 Mar. 15 (*App.* 6.) Rotary [puddling furnaces.
——— H., & Davies, J., 248, Jan. 22, Stoppering bottles.
——— H. L., 492, Feb. 10, Disinfectants and deodorizers.
——— J. A. & E. A., 956 Mar. 15, (*App.* 6.) Rotary [puddling furnaces.
——— J. W., 595, Feb. 18, Clips or fastenings for boots, [&c.
——— R. A., & Perry, J. J., 12, Jan. 1, Lighting cigars, &c.
——— T., 482, Feb. 9, Preserving and rendering wood [uninflammable.
——— T. O., 688, Feb. 25, Ferrules.
——— W. P., 510, Feb. 11, Fire-arms.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.

K.

Kaselowsky, E. (Pieper), 535, Feb. 13, Steam-boilers.
Kaulbach, E., 542, Feb. 15, Rotatory engine.
Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying [apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25, [Surfaces for steps, &c.
Kelen, L. V., 721, Feb. 26, Gas stove.
Kellogg, H. (Crosby), 324, Jan. 28, Fur coated fabrics.
——— *H.* (Crosby), 325, Jan. 28, Head coverings.

Kelly, S. J. J., 521, Feb. 12, Producing letters, &c. upon glass.
Kendall, W. J., & Robinson, G. A., 588, Feb. 18, Castors.
Kendrick, T., 31 Jan. 4, Coffin furniture.
Kennard, H.J., 846, Mar. 8 (*App.* 9.) Stoves and flue pipes.
Kennedy, J., & Wigg, C., 314, Jan. 27, Furnaces.
Kennedy, W., & Acheson, G., 40, Jan. 4, Spinning.
Kerby, J., 274, Jan. 23, Boots.
Kessler, J. L., & Faure, M. J. F. R. (Sauvée), 2897, Aug. 17 (*App.* 8.) Sulphuric acid.
Kidd, J., 531, Feb. 13, Gas.
—— J., & *Arnold, L.*, 66, Jan. 7, Gas.
King, J. T. (*Westinghouse*), 569. Feb. 17, Motive-power engines.
—— N., 2953, Aug. 23 (*App.* 9.) Fire-arms.
Kirby, W., 503, Feb. 11, Coffins.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19, Wrought iron tubes.
Knaust, W. (Wirth), 439. Feb. 5, Valves.
—— *W.* (Wirth), 678, Feb. 24, Stop valves.
Knelles, C. H. (Lake), 486, Feb. 9, Imitation leather, damask, &c.
Knip, J. F. (Bishop), 403, Feb. 3, Exhibiting pictures.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10 (*App.* 3.) Sugar.
Kosloff, S. A., 441, Feb. 5, Electric light.
Kosminski, M., 522, Feb. 12, Articles of dress for ladies.
Kottgen, A. (*Gauhe*), 619, Feb. 20, Coloring matter for dyeing, &c.
Kritch, W. C., 464, Feb. 6, Cutting paper.
Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 19, Treating and dyeing vegetable textiles.
Kuhlmann, H. (Wirth), 679, Feb. 24, Pegging boots.
Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 19. Treating and dyeing vegetable textiles.

L.

Ladd, J. H. (*Whipple*), 621, Feb. 20, Healds for looms.
Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
—— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
—— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
—— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
—— W. R. (*Whittemore*), 163, Jan. 15, Spikes.
—— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.
—— W. R. (*McClintock*), 207, Jan. 19, Preserving substances.
—— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by tram-car conductors.
—— W. R. (*Farris*), 310, Jan. 27, Water circulating bars.
—— W. R. (*Brownlow & Francis*), 340, Jan. 29, Coating for metals.
—— W. R. (*Bogle*), 395, Brushing boots and shoes; polishing, &c.
—— W. R. (*Osborne*), 417, Feb. 8, Harvesting machines.
—— W. R. (*Larkin*), 472, Feb. 8, Furnace grates.
—— W. R. (*Knelles*), 486, Feb. 9, Imitation leather, damask, &c.
—— W. R. (*Lazar*), 536, Feb. 13, Railways.
—— W. R. (*Boivin*), 615, Feb. 19, Cutting leather, &c.
—— W. R. (*Thomas*), 671, Feb. 23, Bustles and pads for ladies' dress.
—— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-menageries.
Lake, W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting ores; making iron; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.) Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18, (*App.* 51.) Device for advertising.
—— W. R. (*Harrison*), 2774, Aug. 5 (*App.* 6.) Harvesters.
Lamarre, E. A. A. (Johnson), 409, Feb. 3, Signalling and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing machines, &c.
Land, E., 706, Feb. 26, Propelling boats.
Larkin, J. B. (Lake), 472, Feb. 8, Furnace grates.
Laslett, T. N., 523, Feb. 12, Measuring heights and distances of objects.
Law, J. H., Redfern, T., & Smith, P., 431, Feb. 5, Paper making.
Lawrance, E., 796, Feb. 30 (*App.* 8.) Curing corns.
Laycock, P., 572, Feb. 17, Stiffening & staining fabrics.
—— W. S., 478, Feb. 9, Electric breaks.
Lazar, A. (Lake), 536, Feb. 13, Railways.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14, Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining powder.
Lee J., 131, Jan. 13, Fire-arms.
—— J. W., 481, Feb. 9, Rotary pumps.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Legat, D. M. (Clark), 463, Feb. 6, Sewing straw hats, &c.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181, Jan. 16, Phosphates and phosphorus.
—— H., Box, J., Aubertin, E., & Boblique, L., 214, Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.) Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Levey, C., & Myles, W., 670, Feb. 23, Nuts & washers.
Lewis, G. H., 137, Jan. 13, Cigars.
—— R. T., 237, Jan. 21, Looking glasses and mirrors.
Liancourt, C. A. Count de G. de, 390, Feb. 3, Preserving life at sea.
Lillie, J., 606, Feb. 19, Kitchen ranges, &c.
Lind, J., 457, Feb. 6, Securing ends of bale bands.
Lindley, L., 683, Feb. 24, Making fabric on lace machinery.
Livesey, J., 599, Feb. 18, Railways and tramways.
Lloyd, C. M., 672, Feb. 24, Window frames; hanging sashes.
—— J., & Scully, J., 226, Jan. 20, Drying wall papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Loebl, S., 614, Feb. 19, Heating and cooking apparatus.
Loewenberg, H., 420, Feb. 4, Imitation braids, leather, &c.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c., threads; stop motion.
Lofts, E., 2153, June 12 (*App.* 9.) Checking monies.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
—— J., & Atherton, W., 699, Feb. 25, Looms.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Lontin, D. F. (Clark), 473, Feb. 8, Application of electro-dynamic machines.

Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail [hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9, [Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing [slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and [axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.) [Thread-spools, pail-handles, &c.
Lyte, F. Maxwell (Clark), 563, Feb. 16, Ammonia.
Lyttle, W. A , 105, Jan. 12, Iron, steel, &c.
—— W. A., 455, Feb. 6, Making alkali, &c.
—— W. A., 627, Feb. 20, Alkali.
—— W. A., 656, Feb. 23, Toilet soap.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving [substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Compositions for paving, &c.
MacDonald, J. C., & Calverley, J., 611, Feb. 19, Printing presses.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids; recovering, &c. [waste products.
—— M., 200, Jan. 19, Compounds for dissolving [resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing [instruments.
Maclaren, J., 415, Feb. 4, Watch protector.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M., [76, Jan. 8, Railway wheels and axles.
McLeod, F. H., 903, Mar. 11 (*App.* 9.) Sheep dip or [composition.
McPhail, W., 220, Jan. 20, Compositors' case frames.
Mc Vicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing [stones, &c.
Maddox, J., Gardner, E., Hughes, T., & Dixon, G., 567, [Feb. 16, Fringes.
Maes, L. (*Fouillon*), 331, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 19, [Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 13, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscriptions, &c.
Malo, G. (Clark), 404, Feb. 3, Ships or vessels.
Manbré, A., 579, Feb. 17, Treating vegetable substances; [making spirits, &c.
—— A., Beldam, W. A., & Allibon, G., 264, Jan. 23, [Steam-boilers.
Mann, W., & Owens, S., 862, Mar. 9 (*App.* 8.) Valves.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard [railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.) [Moulding bricks, &c.
Marchant, R. M., 304, Jan. 27, Furnaces.
Marillier, R. A., 497, Feb. 10, Raising, tipping and [lowering trucks.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marot, L. (Johnson), 408, Feb. 3, Saccharine solutions.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
Marshall, F. A., Skinner, C. W., & Hall, W. J., 530, [Feb. 13, Feed heaters for boilers.
—— J., 162, Jan. 15, Thrashing machines.
Marshall, N., 583, Feb. 18, Fancy hosiery.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-dressing machines.
Martin, T., 468, Feb. 8, Lamps.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Mather, J., 211, Jan. 20, Air-gas.
—— J., & Spier, R., 622, Feb. 20, Gas.
—— W., & Cordillot, H. F. A., 479, Feb. 9, Steaming [printed fabrics.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted [fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.* [44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14 [(*App.* 46.) Hydraulic engines, &c.
Maxwell-Lyte, F. (Clark), 563, Feb. 16, Ammonia.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.) [Applying oil painting to walls.
Maynard, R., 879, Mar. 10 (*App.* 8.) Chaff-cutters.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B. [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing machines.
—— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.* [(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing machines.
Melton, F., 620, Feb. 20, Nail and other brushes.
Melvill, R. A., 554, Feb. 15, Fastening windows, &c.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
Middleton, W., & Hayward, P., 493, Feb. 10, Melting, [&c. metals.
Milburn, R., & Jackson, H., 518, Feb. 12, Treating salts, [ores, &c.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8 [(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
—— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Minns, H. R. (Hardy), 687, Feb. 25, Artificial leather.
Mitchell, J. & W., 410, Feb. 3, Umbrellas and parasols.
—— W. & J., 410, Feb. 3, Umbrellas and parasols.
—— W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Moelchaerek, G. R., & Morgan, O. V., 625, Feb. 20, [Filtering water.
Monk, W., & Rawsthorne, T., 435, Feb. 5, Carding engine rollers.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20, [Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
—— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and [windows.
—— W. (*Crompton*), 146, Jan. 14, Looms.
—— W. (*Viglino & Donna*), 626, Feb. 20, [Motive-power engines.
—— W. (*Verdier*), 654, Feb. 23, Treating peat
—— W. (*Viglino & Donna*), 729, Feb. 27, [Railway axles.
—— W. (*Doty*), 952, Mar. 2 (*App.* 9.) Lamps.
—— W. (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
—— W. (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of [type.

Morgan-Brown, W. (*Johnson & Harding*), 2250, June 19
[(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-
[way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying
[gas for aërial purposes.
Mosman, D. F., 751, Mar. 1 (*App.* 36.) Generating and
[utilizing steam.
Mountford, E. C. & W., 292, Jan. 26, Games.
——— W. & E. C., 292, Jan. 26, Games.
Muirhead, A., & Taylor, H. A., 684, Feb. 24, Telegraphs.
Mulholland, J. R. T., & Porter, W. M., 647, Feb. 22,
[Carding engines.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit-
[ting hats, &c.
Munn, A., Rennie, J., & Sutherland, J., 419, Feb. 4,
[Sinking cylinders for foundations.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.)
[Sewing-machines.
Murray, A. W., 382, Feb. 2, Lamps.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and
[parasols.
Myers, M., 570, Feb. 17, Pen boxes, &c.
Myles, W., & *Levey, C.*, 670, Feb. 23, Nuts and washers.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Napier, W. D., 633, Feb. 20, Tooth and flesh brushes or
[rubbers.
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Neil, C., 402, Feb. 3, Stocks and dies.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Neuhaus, M., 668, Feb. 23, Gas.
Neuss, H. F. (Wirth), 705, Feb. 25, Needle machines.
Newbold, E., 267, Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding,
[&c. fibres.
Newton, A. V. (*Borchart*) 385, Feb. 2, Bullet patching
[machinery.
——— A. V. (*Felt*), 600, Feb. 18, Ordnance.
——— E., 624, Feb. 20, Frame saws.
——— H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding
[engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27,
[Tramways.
Noad, J, 592, Feb. 18, Steel.]
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Nussey, G. H., & Leachman, W. B., 139, Jan. 14, Punch-
[ing and rivetting machines, &c.

O.

Oexle, O. (Johnson), 561, Feb. 16, Grinding corn, &c.
Olpherts, R., 560, Feb. 16, Screw presses, &c.
Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13,
[Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Osborne, D. M. (Lake), 471, Feb. 8, Harvesting ma-
[chines.
Osmond, J., 547, Feb. 15, Dog-carts, &c.
Outerson, A. & J., 558, Feb. 16, Filters.
——— J. & A., 558, Feb. 16, Filters.
Owens, S., & Mann, W., 862, Mar. 9 (*App.* 8.) Valves.

P.

Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine),
[1008, Mar. 18 (*App.* 38.) Paper boxes.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Parker, G., 556, Feb. 16, Riddling and loading coal, &c.
Parkinson, R., Catlow, S., & Blackburn, B., 720, Feb. 26,
[Spinning mules.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and
[engines.
Payton, W., & Holmes, J. E., 343, Jan. 29, Sawing
[machinery.
Peacock, J. C., & Rudkin, T., 590, Feb. 18, Cooking, &c.
Pearson, D. R., 516, Feb. 12, Backs and handles for
[brushes.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces,
[purses, &c.
Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
——— W., 533, Feb. 13, Communicating in trains.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Petit, H. J., 501. Feb. 10, Sewing-machines.
Pflaum, J. F. A., & Walker, B., 719, Feb. 26, Hydraulic
[machinery
Phelps, H. W., & Winchester, E. S. (Haseltine), 485
[Feb. 9, Rock drills.
Pictet, R. P., 2727, Aug. 3 (*App.* 6.) Sulphurous acid;
[producing cold.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieper, C. (*Kaselowsky*), 535, Feb. 13, Steam-boilers.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drink-
[ing bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pinchbeck, J., 669, Feb. 23, Fire lighters.
Pitchford, W. F., 726, Feb. 27, Dissolving gums.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
——— R. P., 448, Feb. 6, Trapping waterclosets, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2,
[Preparing fibres for spinning.
Porter, E. B. (Clark), 1042, Mar. 22 (*App.* 7.) Screw
[propellers.
Porter, G., 430, Feb. 4, Gas-burners.
——— W. M., & Mulholland, J. R. T., 647, Feb. 22,
[Carding engines.
Potter, E. P., 658, Feb. 23, Concentrating acids.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Venti-
[lating water closets, &c.
Pounsett, R., 447, Feb. 5, Vinegar.
Powell, R. (Clark), 2997, Aug. 26 (*App.* 9.) Iron ships.]
Powleson, W. L., 2565, July 17, (*App.* 4.) Steam super-
[heaters.
Pregardan, J. (Hessel), 1636, May 3 (*App.* 45.) Steam-
[boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Puente, S., 436, Feb. 5, Sheep shear.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10
[(*App.* 3.) Sugar.

Q.

Queen, J. W., & Co. (Beck), 689, Feb. 25, Prism for
[spectroscopic and other purposes.
Quick, J., & Restler, J. W., 696, Feb. 25, Swing bridges.

R.

Ramsay, F. (*Low*), 1956, May 28 (*App.* 48.) Sail hank
[or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21, Creased or
[plaited fabrics.
Rawsthorne, T., & Monk, W., 435, Feb. 5, Carding en-
[gine rollers.
Read, W., 379, Feb. 2, Buttons; attaching same.
***Reckendorfer**, J.* (Marler), 215, Jan. 20, Pencil cases.
Redfern, T., Smith, P., & Law, J. H., 431, Feb. 5, Paper
[making.
Redheffer, W. (Benson), 388, Feb. 3, Freezing, churn-
[ing, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.
Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit-
[ting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reeves, T., 424, Feb. 4, Sewing-machines.
Reid, W., 166, Jan. 15, Sewing machines.
Rendel, A. M., 697, Feb. 25, Swing bridges.
Rennie, J., Sutherland, J., & Munn, A., 419, Feb. 4
[Sinking cylinders for foundations.
Restler, J. W., & Quick, J., 696, Feb. 25, Meters.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201,
[Jan. 19, Railway signals and points.
——— F. W., 709, Feb. 26, Saw benches.
——— G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
——— O., 724, Feb. 27, Obtaining motive power, &c.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Richardson, J., & Ball, C. J., 564, Feb. 16, Combined
[engine, &c., and air compressor.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for
[floors, &c.
Rider, F. W., & Hutchence, H., 383, Feb. 2, Harmo-
[niums, organs, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., &
[Hough, J. E., 350, Jan. 29, Sewing machines.
Roberts, A. & G., 636, Feb. 20, Pianofortes.
——— G. & A., 636, Feb. 20, Pianofortes.
——— T., 585, Feb. 18, Ships.
——— W. A., & Tantum, A. J., 443, Feb. 5, Work-
[ing sewing-machines.
***Robinson**, C. E.* (Clark), 338, Jan. 28, Feeding and
[burning oils in furnaces.
Robinson, G. A., & Kendall, W. J., 588, Feb. 18, Castors.
——— R. C., 795, Mar. 4 (*App.* 9.) Clay pipes.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing
[machines, &c.
Rogers, H. (***Mullholland***), 161, Jan. 15, Cut nails.
——— J., 598, Feb. 18, Water columns.
Rogers, W. (Lake), 2045, June 8 (*App.* 49.) Smelting
[ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Romanes, J., 716, Feb. 26, Roller skates.
Rood, G. A., & Hallett, B., 630, Feb. 20, Bicycles.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
——— T. & F., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway
[signalling.
——— *D.* (Clark), 2740, Aug. 4 (*App.* 6.) Railway
[signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and
[forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
——— S. H., 649, Feb. 22, Waterclosets.
Rudkin, T., & Peacock, J. C., 590, Feb. 18, Cooking, &c.
Russell, H., 109, Jan. 12, Registering garments, &c.
[sent to laundries.
——— J., & Dominy, G., 398, Feb. 3, Guards for carv-
[ing forks.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Russell, W., 1445, Apr. 21 (*App.* 9.) Metal furnaces.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.
Ruthven, W., 587, Feb. 18, Fire-lighters.
Rydill, G., 150, Jan. 14, Purifying sewage, &c.
———G., 399, Feb. 3, Purifying sewage, &c.

S.

Sainty, J., 708, Feb. 26, Dressing and drying corn & seeds.
Salmon, J., & Crosland, W., 581, Feb. 17, Grinding and
[polishing stones.
Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
[cussion caps.
Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.
——— A. (*Faure & Kessler*), 2897, Aug. 17 (*App.* 8.)
[Sulphuric acid.
Savage, W. P., 271, Jan. 23, Preventing accidents on
[railways.
Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25
[Surfaces for steps, &c.
Scantlebury, W., & Rath, F., 232, Jan. 21, Creased or
[plaited fabrics.
Schnabel & Henning (Brunner), 505, Feb. 11, Portable
[cranes.
Schofield, C. J., 511, Feb. 11, Furnaces.
Schrebler, G., 477, Feb. 9, Pistons.
Schulte, A. (Vollmer), 460, Feb. 6, Copying ink pencil.
Schultz, A. (Holliday), 498, Feb. 10, Printing fabrics.
——— *A.* (Holliday), 499, Feb. 10, Bleaching fabrics.
Schulz, J. J., & Clay, T., 701, Feb. 25, Tension mechanism
[for warp beams.
Schwanck, C. F., 618, Feb. 20, Elastic sprink hook.
Scott, F. (Cranston), 677, Feb. 24, Portable lathes for
[dentists and jewellers.
Scott, G., 128, Jan. 13, Glass furnaces.
——— H. Y. D., 135, Jan. 13, Purifying gas.
——— H. Y. D., 373, Feb. 1, Manures.
——— J. (*Gerard*), 38, Jan. 4, Finishing fabrics, &c.
——— J. C., 170, Jan. 15, Moulding toothed wheels, &c.
——— J. P. (*Haag*), 236, Jan. 21, Heating railway
[carriages.

Whitehouse, W., 596, Feb. 18, Sustaining artificial teeth
[in the mouth.
Whitelaw, A.. 641, Feb. 22, Lock for tip carts.
Whittaker, T., Duxbury, J., & Clayton, J., 73, Jan. 8,
[Bricks, tiles, &c.
Whittemore, A. (Lake), 163, Jan. 15, Spikes.
Whyte, A. C., 487, Feb. 10, Saving life from shipwreck.
Wicks, J. F. (Benson), 1139, Mar. 30 (*App.* 7.) Looms.
—— *J. F.* (Benson), 1199, Apr. 2 (*App.* 40.) Pattern
[chains for looms.
Wier, M. A., 504, Feb. 11, Measuring flow of liquids.
Wigg, C., & Kennedy, J., 314, Jan. 27, Furnaces.
Wigham, J. R., 356, Jan. 30, Fog and other signals.
Wilcke, H., 4, Jan. 1, Propelling screw steam ships.
Wilcox, M., 406, Feb. 3, Combined seal and watch key.
Wilkinson, A., 60, Jan. 6, Compounds for paving, fuel, &c.
—— J. F., 380, Feb. 2, Obtaining motive-power.
Willans, J. G., 157, Jan. 14, Furnaces.
Williams, H., & Evans, P., 22, Jan. 2, Stoppering bottles.
Williams, I. F. (Benson), 437, Feb. 5, Boots and lasts.
Williamson, C., 82, Jan. 9, Stays and corsets.
—— W. B., 602, Feb. 18, Preventing pollution of
[rivers, &c.
Willis, J., 298, Jan. 26, Umbrellas and sunshades.
Wilmart, O. J., 1085, Mar. 24 (*App.* 39.) Welding wrought
[iron and steel.
Wilson, A. (Lake), 2234, June 17 (*App.* 51.) Steam-boiler
valves.
Wilson, M., McLay, J. C. S., Warren, F. P., & Brodie, W.,
[76, Jan. 8, Railway wheels and axles.
—— T. W., 474, Feb. 8, Cleaning bottles.
—— W., & Battersby, J., 375, Feb. 2, Cutting and
[pulping roots.
Winchester, E. S., & Phelps, H. W. (Haseltine), 485,
[Feb. 9, Rock drills.
Winder, R., 74, Jan. 8, Distributing type.
Wirth, F. (*Emmerich*), 193, Jan. 18, Fire-arms.
—— F. (*Leiter*), 296, Jan. 26, Electric apparatus.
—— F. (*Knaust*), 439, Feb. 5, Valves.
Wirth, F. (*Wertheim*), 637, Feb. 20, Ship furnitures.
—— F. (*Knaust*), 678, Feb. 24, Stop valves.
—— F. (*Kuhlmann*), 679, Feb. 24, Pegging boots.
—— F. (*Neuss*), 705, Feb. 25, Needle machines.
Wise, W. L. (*Levet*), 3, Jan. 1, Boring rock, &c.
—— W. L. (*Solvay*), 820, Mar. 5 (*App.* 9.) Washing
[gas, &c.; distilling liquids.
—— W. L. (*Kay*), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.
Wollaston, C. J., 58, Jan. 6, Thermo-electric apparatus.
Wolstencroft, E., 631, Feb. 20, Temples for looms.
Wolverson, E., 763, Mar. 2 (*App.* 9.) Corkscrews, augers,
[screw-drivers, &c.
Wood, G. R., 508, Feb. 11, Furnaces.
Woodward, H. F., 551, Feb. 15, Overalls.
Worrall, A. J. & J., 189, Jan. 18, Shaping and cutting wire.
—— J. & A. J., 189, Jan. 18, Shaping and cutting wire.
—— S., 640, Feb. 22, Drawing card pins.
Wright, E., 754, Mar. 2 (*App.* 36.) Transmitting and
[controlling motion.
—— M., & Pollard, J., 133, Jan. 13, Driving spindles.
Wyrill, M. B., 648, Feb. 22, Preparing and combing
[fibrous substances.

Y.

Young, Mc C. (Haseltine), 1317, Apr. 10 (*App.* 42.)
[Cutting match splints.

Z.

Zimmermann, J. F., 95, Jan. 11, Candle holders.
Zysell, F., & Warschawsky, J., 347, Jan. 29, Pressing or
[ironing.

Whitehouse, W., 596, Feb. 18, Sustaining artificial teeth
[in the mouth.
Whitelaw, A.. 641, Feb. 22, Lock for tip carts.
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——— F. (*Neuss*), 705, Feb. 25, Needle machines.
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TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX AND SPECIFICATIONS

FROM JAN. 1 TO FEB. 27, 1875, AND TO

APPENDIXES FROM FEB. 28 TO AUG. 27, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 36 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 9, with the weekly Nos. of the Index for the present year.]

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CONTAINING THE

ABRIDGMENTS OF PROVISIONAL AND COMPLETE SPECIFICATIONS

Delivered from February 28 to March 3, 1875.

A.D. 1875, March 1.—No. 734.

CHAMBERS, Austin, of No. 258, Marylebone Road, in the county of Middlesex, signal engineer.—" Improved apparatus for facilitating the ignition of gas in the lamps of railway carriages."

This invention consists in connecting together the several lamps in a carriage or train of carriages by perforated pipes combined with deflecting guard plates, by which flame is communicated from jet to jet when the gas is turned on in the perforated pipes, so that all the lamps in a carriage or train may be readily lighted by turning a cock and applying a light at a single point. Sometimes an external light is dispensed with by applying gas or other lights arranged in chambers in proximity to the perforated pipes, so that to light the lamps it is only necessary to turn a cock.

The cocks of the lighting mains are arranged to close automatically.

A.D. 1875, March 1.—No. 735.

GRAFTON, Sidney, 26, Regent Place, in the borough of Birmingham, in the county of Warwick, engineer.—"Improvements in instruments for affixing postage and other adhesive stamps and " labels."

My invention consists of an instrument to be used in the hand having points or prickers attached to pick up postage or other adhesive stamps, by which the said points or prickers are brought in contact, with more or less force, with a resisting surface. A reciprocating motion is produced by means of a spiral spring pressing upon a plate to which the points or prickers are attached, and which points or prickers pass freely through a fixed plate which comes in close contact with the postage or other adhesive stamp when sufficient force is exerted, thereby leaving the stamp firmly affixed.

A.D. 1875, March 1.—No. 736.

CHATTERTON, John, of Glossop, in the county of Derby, engineer.—" Improvements in railway " chairs and in the method of and means for securing the rails within such chairs."

The inventor employs an iron wedge having a recess to contain wood packing to hold the rail in the chair. Grooves are formed in the wedge and a projection on the chair. A spike is driven into the sleeper and entering one of the said grooves holds the wedge, the said projection supporting the spike.

A.D. 1875, March 1.—No. 737.

KEIRBY, John Edward, of Swinton, in the county of Lancaster, steam packing manufacturer.—" Improvements in elastic and other packings for pistons and piston rods of steam engines, pumps, " rams, and other similar purposes."

The features of novelty in this invention consist in combining a metallic wire-work exterior with the elastic and other descriptions of packing used for the glands of piston rods, for packing pistons, and for other similar purposes, which is effected by lapping, braiding, or plaiting these descriptions of packing with thin metallic wire, by preference copper, and whereby such packing is rendered more durable, and friction is considerably reduced.

A.D. 1875, March 1.—No. 738.

KENYON, John Henry, and **KENYON**, James, both of Blackburn, in the county of Lancaster, cotton spinners.—" Certain improvements in machinery for carding cotton and other fibrous substances."

[No. 10.] *Price 4d.*

Our invention consists in applying a stationary or revolving presser roller to the carding rollers or dirt rollers to press the fibres and dirt into the teeth of the cards. By this means the carding is improved, the cleaning is economised, and waste is reduced; also in applying a revolving fan or winged layer or perforated roller, through which air is forced to lay the fibres on card rollers.

A.D. 1875, March 1.—No. 739.

RICHARDS, John Morgan, of Southampton Row, in the county of Middlesex, merchant.—(*A communication from Daniel F. Packer, of Mystic River, in the State of Connecticut, United States of America.*)—"An improvement in the manufacture of artificial fuel."

The invention consists in manufacturing artificial fuel by mixing coal dust with a resinous substance while the latter is in a cool, dry, and pulverized condition, and then causing a more intimate mixture by subjecting the substances together, and while being agitated, to the action of heat.

A.D. 1875, March 1.—No. 740.

SHAW, Benjamin, gig rod maker and smith, CRABTREE, Thomas, millwright, and WOODHEAD, William, designer, all of Huddersfield, in the county of York.—"Improvements in looms for "weaving."

This relates to the "jacks" employed in looms for working the healds or harness for "shedding" or forming the openings of the warp for introduction of the weft, and consists in having the shank of the "jack" joint pin square or angular and the hole in that part of the "jack" of suitable form, so that the pin will fit therein and so as not to turn round in the hole.

A.D. 1875, March 1.—No. 741.

ELLIS, James, of Bradford, in the county of York.—"Improvements in or applicable to pianofortes, "organs, and harmoniums."

The object of this invention is to construct pianofortes, organs, harmoniums, and other similar keyed instruments in such manner that music may be transposed mechanically or without mental effort on the part of the performer, or the necessity of writing the piece to be transposed in the required key. This I effect by mounting the keys on a keyboard capable of sliding longitudinally or endwise. On the underside of the keyboard is a stud passing through a slot in one end of a lever hinged at about its centre; on the other end of which lever is a catch or tooth capable of entering any of a series of notches formed in a suitably placed segment plate. The notches in the plate correspond with the number of keys or notations used in writing music, that for the natural key or C being by preference in the centre; to effect a change in or alter the key the lever is moved a notch or more in either direction.

A.D. 1875, March 1.—No. 742.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Rudolf Taetz, of Moscow, in the Empire of Russia, chemist.*)—"Improvements in "the manufacture of capsules for enclosing medicaments and other substances, and in the apparatus "employed therein."

This invention relates to elastic or flexible capsules intended more particularly for containing medicaments, so as to enable the same to be introduced into the stomach without having any action upon the organs of taste; and it consists in forming the capsules of a peculiar composition of substances, and of an improved mode of and apparatus for producing such capsules.

The capsules are composed of a mixture of the following substances in about the undermentioned proportions, vizt.:

About 1 part of best gelatine.
,, 1½ ,, chemically pure glycerine.
,, 2½ ,, distilled water.

A.D. 1875, March 1.—No. 743.

NOTTON, Sebastien, of St. Claude, Jura, France, but at present of 33, Chancery Lane, London, in the county of Middlesex.—"Improvements in machinery for cutting or carving in wood, ivory, stone, and "other materials."

A guide point is caused to work by an attendant over a pattern, and corresponding engraving tools are caused to engrave and reproduce the required pattern on the materials to be carved. Two parallelogram frames are caused to incline backwards or forwards as the position of the tools may be required to be changed.

A.D. 1875, March 1.—No. 744.

DICKSON, John Farmerley, of Leicester, in the county of Leicester.—" Improvements in air and gas " engines or motors."

The piston rod has a double rack, one to gear into a wheel on the main shaft for the upward or downward stroke, and the other into another wheel double the size of the former for the downward or upward stroke, the latter wheel acting through the intermediation of other wheels upon the main shaft, whereby a continuous motion of the main shaft is established without variations of speed.

A.D. 1875, March 1.—No. 745.

HUNTER, Robert Hope Alston, of 65, Malvern Road, Dalston, in the county of Middlesex, student of medicine.—" Improvements in and additions to invalid bedsteads."

A frame is placed under a bedstead, and has a socket through which a stem passes which can be raised up and down. The top of the stem has a padded plate on which a bed pan can be placed and be wound up level with the top of the bed by a belt or screw arrangement.

A.D. 1875, March 1.—No. 746.

WHITE, John, of 166, Fleet Street, in the city of London.—" Improvements in the manufacture of " chromates of potash and soda and their bichromates."

This consists in slaking lime with sulphate of potash *in solution*, and adding chrome ore to this mixture.

A.D. 1875, March 1.—No. 747.

SMITH, Augustus, of Marsh Gate Lane, Stratford, in the county of Essex, brush manufacturer.— " Improvements in brushes for painting and similar purposes."

According to the above invention metal or other ferrules have top flanges.

A.D. 1875, March 1.—No. 748.

EDWARDS, Edmund, of the firm of Edwards and Co., 38, Southampton Buildings, Chancery Lane, in the county of Middlesex, engineers and patent agents.—(*A communication from John Crist, of the city, county, and state of New York, United States of America.*)—" Improvements in furniture castors."

This invention consists of forming the wheels for castors of cupped plates of the shape described with or without internal filling or stays and tubular bushes. Also of forming such wheels in two parts, each struck up out of a single piece of metal with flanges and web, a bracing washer between them, and a tubular centre holding them together. Also of making castor wheels or pullies of two similar parts divided on a plane passing through the rim, the two parts being stamped or struck out separately and then attached together. Also of forming the horn for castor wheels with the bearing for spindle made by drawing down the metal in making the necessary aperture. Also of forming the bearing for the spindle in such horns by inserting an eyelet in it. Also forming the vertical pin hole in English horns for castors by rolling the plate round so as to form a tube. Also of forming the socket, in which the pin of any castor works, and the plate, which carries the socket, of one piece of metal by stamping. Also of forming the socket by rolling and attaching it to a separately made plate. Also the arrangement, in any castor, of three or more antifriction rollers revolving between the plates of the socket and the horn, and having a loose washer with suitable recesses to keep the rollers at the proper distance apart, or of an annular chamber formed in the socket plate for the same purpose.

A.D. 1875, March 1.—No. 749.

HARRISON, William Henry, of Oxendon House, Oxendon, in the county of Northampton.—" Improvements in boxes for containing tooth powder and other such like powders."

This Provisional Specification describes forming boxes for containing tooth powder and other such like powders in such a manner that a small quantity of the powder may be applied on to the brush each time of using it without spilling any of the powder or moistening the powder which remains in the box.

A.D. 1875, March 1.—No. 750.

LE MOYNE, Joel H., of Boston, in the county of Suffolk, in the state of Massachusetts, one of the United States of America.—" A combined mule and shuttle spindle."

My invention relates to improvements in mule spindles, and consists in making such spindles in two parts, on the upper one of which the cop is spun; after which I detach the upper part of said spindle with the cop on it from the lower part thereof, and secure such upper part of a mule spindle with the cop on it in a suitable manner to a loom shuttle, by which arrangement the cop is placed in a loom shuttle without being transferred from the original spindle on which it was spun in the mule.

A.D. 1875, March 1.—No. 751.

MOSMAN, Daniel Frank, of Chelsea, in the county of Suffolk, in the state of Massachusetts, in the United States of America.—" Improvements in the method of and apparatus for generating and " utilizing steam."

This complete Specification describes this invention as follows:—The invention relates to means for developing and utilizing the latent heat contained in the exhaust steam of steam engines which is now suffered to go to waste, either by allowing it to exhaust directly into the atmosphere, or by conducting it through an apparatus and heating feed water for the boiler, to a degree of heat not exceeding 212° Fahrenheit.

My system consists mainly in discharging the said exhaust steam into a vessel which is closed to the atmosphere, and which contains the feed water from which the boiler is supplied, the exhaust steam preferably being admitted below the water and exhausting into or below it, the water after being heated being pumped to the boiler.

A very high degree of latent heat is contained in the exhaust steam of steam engines, which up to this time no apparatus has been able to develope and utilize. By exhausting this steam into a chamber entirely closed to the atmosphere, I develope and make use of the 964 units of heat which exist between the boiling point of water (212°) and the point at which steam pressure begins (1176).

By my method of heating the feed water, I raise its temperature, and deliver it to the boiler with 1148 units of heat, thus using in the engine and wasting but 28 units, and utilizing in heating the feed water 1148 units. I also gain several other important points.

A.D. 1875, March 2.—No. 752.

MORGAN-BROWN, William, of the firm of Brandon and Morgan-Brown, engineers and patent agents, of 38, Southampton Buildings, London, and 13, Rue Gaillon, Paris.—(*A communication from Henry Harrison Doty, of* 13, *Rue Gaillon, Paris, gentleman.*)—" Improvements in lamps for signalling " for railways, for ships, and for other purposes."

This invention describes a lamp for signalling with sliding colored glasses or lenses or a reflector; when required to be controlled the light is thrown upon two different points.

A.D. 1875, March 2.—No. 753.

BURDESS, Adam, of Coventry, in the county of Warwick, watch manufacturer.—" Improvements in " railway breaks."

The novelty in this case consists in detaching the lower end of the vertical actuating rod in the ordinary vertical rod and lever arrangement from the break-levers, and placing the lower part of such vertical rod in independent bearings or guides; so that, when the hand lever above is turned, the said rod is connected to the said levers by screw or other arrangement, and operates the breaks in the usual way; thus allowing the application of my method of operating railway breaks by the action of the buffer-rods without removing the old break-blocks or their adenda.

A.D. 1875, March 2.—No. 754.

WRIGHT, Edmund, of Birmingham, in the county of Warwick.—" Improved means of transmitting " and controlling motion in machines and hand tools, the invention being also applicable as a brake " for railway and other vehicles."

The invention consists in the employment of a curved wedge, combined with an unyielding roller acting on a corresponding circular surface, the object of the invention being to provide a substitute for the ordinary ratchet or toothed wheel and pawl.

A.D. 1875, March 2.—No. 755.

SMITH, Henry, of Henrietta Street, Covent Garden, in the county of Middlesex, electro-plater, and **HADDAN**, John Coope, of 32, Treherne Road, Brixton, in the county of Surrey, civil engineer.— " Improvements in joining up or connecting together the ends of railway rails."

Halving, lapping, or stepping the end of one rail so as to lie horizontally upon and over the halved, lapped, or stepped end of the adjoining rail, the said two ends being stiffened and secured with fish-plates bolted to and through the rails. Also the recessing the ends of one rail or of both rails, and keying them together by a block or key, the said ends being stiffened and secured with fish plates as before, the key being formed on the end of one rail or applied as a separate piece, accordingly as one end or both ends are recessed, or the key may be formed partly upon one and partly upon the other of the pair of fish plates.

A.D. 1875, March 2.—No. 756.

THOMPSON, Nathan, of the city of Brooklyn, and state of New York, in the United States of America, but at present of 23, Southampton Buildings, in the county of Middlesex.—" Improvements in means " for stopping bottles, jars, and other hollow articles, and in means for facilitating the removal of such " stoppers from the articles to which they are applied."

Instead of mounting wing pieces, each upon a separate pin joint, the ends thereof are caused to overlap each other, and are mounted upon a single pin joint. A tool is sometimes employed to facilitate the removal of such stoppers from the articles to which they are applied.

A.D. 1875, March 2.—No. 757.

BROUGHTON, Thomas, **BRIGG**, Charles, and **BRIGG**, Thomas Hargreaves, all of Keighley, in the county of York.—" Improvements in means or apparatus employed in preparing, spinning, and " doubling wool and other fibrous material."

The object of the invention is to obtain a more perfect preparing, spinning, or doubling.

For this purpose in place of the ordinary cap or fly to aid the feeding on to the bobbin in preparing, spinning, and doubling apparatus, the fibre is passed through one or other number of a series of holes with slits thereto in a ring or flange depending on the extent of tension desired.

This ring or flange is formed on a short tube formed with a wharve; and it is caused to revolve at the speed desired by band or otherwise in or upon a stationary tube or socket within which the bobbin rises and falls as desired. The lower part of this short tube or wharve revolves in or is supplied with oil from an oil cup or channel, whilst it rests on a hardened ring or step.

When a portion of the short tube or wharve is formed to revolve in a cup or channel, that portion is externally formed with a screw thread, which is cut in a direction such that would cause it to unscrew in its rotation, that is to say, supposing this socket with its ring to be caused to revolve from right to left, this external screw would then be what is called a left hand screw. By this means air is in the revolution of this wharve caused to pass down to the oil to prevent such oil from rising up the external surface.

A corresponding thread is also formed in the portion of this tube or wharve next the socket, or on the corresponding portion of the socket or hollow stud except that, whilst the direction of this thread as applied on the interior of the short tube or wharve would be in the same direction as that on the outside thereof, when such thread is applied on the exterior of the socket or hollow stud on which such tube or wharve revolves, it would be in the opposite direction.

The object in this case is to prevent the oil rising between the socket or wharve and the tube or hollow stud on or in which it turns and be thrown on the yarn.

The spindles are each fixed stationary to their rising and falling rail, and the bobbin tubes rest on friction washers on pillars formed to raise the bobbins, so that their lower parts may be raised by the lifter rail about to the level of the top of the socket or hollow stud and the feed ring or flange.

The bobbins and their tubes are connected together by pin as usual in cap spinning.

These rings or flanges and their wharves may be formed of ebony or other hard wood as well as of metal.

We also apply in the oil cup or channel a ring of felt or other suitable material to prevent the too free rising of the oil.

A.D. 1875, March 2.—No. 758.

BREWER, Edward Griffith, of Chancery Lane, London.—(*A communication from Rudolph Müller, of Berlin, Prussia.*)—" Improvements in couplings for railway carriages."

A coupling formed of two spirals screwed into one another automatically; when the carriages are pushed against one another, a pawl actuated by a handle at each side of carriage serves to disconnect the coupling,

A.D. 1875, March 2.—No. 759.

HARRINGTON, John, and **WATKINS**, Dudley, both of Ryde, in the Isle of Wight.—" Improvements " in roller skates."

The invention has for its object improvements in roller skates, whereby the skater is enabled readily to skate in straight or curved lines without putting undue strain on his feet and ancles.

A.D. 1875, March 2.—No. 760.

DEFTY, Henry, of Middlesbrough, in the county of York, engineer.—" A new or improved method " of regulating and controlling the motion of various kinds of machinery."

The novelty in this case consists in so arranging and fixing two levers or series of levers, rods, wires, ropes, and the like, connecting the said levers respectively with the throttle-valve and hand-gear of steam-engines, that when the moving body arrives at a certain arranged point, the said body raises one end of one of the said levers and operates the throttle-valve of the engine and regulates the supply or shuts off the steam, and also by raising the other lever reverses the motion of the engine. In the case of locomotives the break can be applied by a simmilar arrangement.

When more convenient a hand-wheel and worm-screw, or wheel and pinion arrangement is used instead of levers. The whole being self-acting.

For controlling and regulating the supply of steam and the motion of engines, I attach a hand-lever or other suitable contrivance to be operated by the person or persons in charge.

A.D. 1875, March 2.—No. 761.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Henry Wardwell Shepard, of Brooklyn, and Robert Seaman, of New York, both in the state of New York, United States of America.*)—" Improvements in apparatus " for regulating the flow of gas, steam, or air."

According to the said invention I secure in a suitable shell or casing provided with openings for the ingress and egress of the gas or other medium an elastic diaphragm, elastic chamber, or a plunger, and I secure to the said elastic diaphragm, plunger, or elastic chamber by suitable gearing a valve which is automatically arranged to open and close an orifice or opening in or which shall lead to the supply pipe.

A.D. 1875, March 2.—No. 762.

WALKER, Thomas, of Birmingham, in the county of Warwick, manufacturer.—" A new or improved " fastener for fastening neckties, scarves, and cravats, and for other like uses."

This invention consists of a fastener having a ring-like body of an elliptical figure by preference, and having jointed to its top a tongue or pin which passes through the opening in the body and terminates a little below the lower edge of the body. This tongue or pin may be raised nearly at right angles to the body, or shut down upon the body, a spring retaining it with considerable force in either its raised or depressed position. The tongue being raised, the ends of the necktie or scarf are passed through the ring-like body of the fastener from the back to the front, and the tongue is shut down. By the shutting down of the tongue the ends of the necktie or scarf are held firmly between it and the body. By raising the tongue the necktie or scarf is released.

A.D. 1875, March 2.—No. 763.

WOLVERSON, Edwin, of Birmingham, in the county of Warwick, machinist.—" Improvements in " corkscrews, which improvements are also applicable to screw-passers, augers, screw-drivers, and " other similar hand tools."

According to this invention the cross handle of the corkscrew is loose and works between two collars on the stem of the worm. The opposed faces of these collars are made into toothed ratchets, with one or the other of which ratchets a corresponding ratchet on the upper or lower face of the handle may be engaged, and when engaged a backward and forward twisting motion of the handle gives rotation to the stem, and causes the worm either to advance in or be withdrawn from the cork, the motion of the worm being effected without loosing the handle.

The arrangement of parts described may be applied to screw-passers, augers, screw-drivers, and other similar hand tools which in use have a rotary motion communicated to them.

A.D. 1875, March 2.—No. 764.

CHESHIRE, John, of Birmingham, in the county of Warwick, corkscrew manufacturer.—" Improve-" ments in solitaires, sleeve links, and other like dress fastenings and ornaments."

According to this invention, two arms are jointed to the back of the solitaire, the said arms being capable of being raised parallel to one another or of being turned down so as to cross the solitaire. A spring bearing on the heels of the jointed arms holds them firmly either in their open or expanded position or in their closed or collapsed position.

When the arms are closed or brought parallel to one another, they may be passed through the holes in the sleeve, and by opening out the arms they cross the said holes and fasten the solitaire. By closing the arms they may be drawn through the holes in the sleeve and the solitaire removed.

A.D. 1875, March 2.—No. 765.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Francis C. Nye, of New York, in the United States of America.*)—" Improvements " in snap-hooks."

This invention relates first to an improved snap hook, which is made of one piece of wire or other flexible and elastic material, and composed of the loop, sides, and two hooks, and has the plane of the loop the same as that of the hooks, and about at right angles with the plane of the sides. Each arm of the snap hook between the loop and the hooks has a convex bend, one above and the other below the horizontal plane of the loop, thus forming a swell in the sides of the snap hook. The loop is made of a square, round, bow shaped, oval, or other desired form, and the hooks are made so as to lock the arms together, where they are crossed after forming the swell, or in the reverse manner, with or without a crossing in the arms between the swell and the hooks. The hooks are formed in such position that the close part of each hook covers the open part of the other; and thus the two hooks make a close eye. The arms between the loop and the swell are locked together, or not crossed, thus leaving an opening between the loop and the swell.

This invention secondly relates in general to snap hooks made of one piece of wire or other flexible and elastic material composed of loop, swell, and two hooks or close eye, and opening and closing by the elasticity or resiliency of the material. It is proposed to make these snap hooks with the arms crossed or locked together between the loop and swell, as well as between the swell and hooks. Each arm may be passed across the other in locking the arms together or simply crossing them.

This invention thirdly relates in general to snap hooks, made wholly of one piece of wire or other flexible and elastic material, and composed of loop, swell, and close eye; and it consists in forming the swell and eye in the plane and the loop in the same or a different plane, with the arms crossed or locked together, or not crossed between the loop and swell and crossed between the swell and eye, and having the same or reverse positions relatively to each other at the crossing between the swell and eye and between the loop and swell; and in forming the eye of two hooks overlapping each other, and so made that the upper hook is in the lower arm at the crossing between the swell and eye and the lower hook is in the upper arm at that crossing; and in forming the hooks so that those ends meet and fit together, thus making a continuous close eye capable of opening to receive a ring, link, or other article.

A.D. 1875, March 2.—No. 766.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Francis C. Nye, of New York, in the United States of America.*)—"Improvements " in snap-hooks and other similar articles."

The improvements embraced in this invention relate, first, in general to snap hooks which have a loop, sides, and close eye, or hooks standing about in a plane at right angles to the loop, and which may be readily connected with the rein, strap, ring, link, or other articles to which they are applied, and disconnected from it by hand, although composed of one piece of wire or other flexible material of requisite strength and elasticity without any spring of a flat, coil, or other shape fastened to or formed in the snap hook.

In carrying out this part of the invention according to one arrangement the right hand arm (looking at the loop in a horizontal position is sprung up and bent over and across the left hand arm, which is sprung down and bent under and across the right hand arm; and the arms are locked together next to the hooks, which are of oval form. Or the arms may be sprung and locked together in the reverse manner, that is, the left hand arm sprung up and bent over and across the right hand arm, which is sprung down and bent under and across the left hand arm. The snap hooks may be made without any swell in the sides, and with round loops linked together at their loops and otherwise similar to those hereinbefore described. They may be provided with finger pieces for the thumb and forefinger to bear against in opening the hooks; these pieces may be made of metal or other materials soldered or otherwise firmly secured to the arms, or they may be made as part of the snap hook itself by flattening or spreading the sides. The ends of the snap hooks may be milled upon their entire circumference or otherwise.

This invention relates, secondly, to the class of snap hooks and other similar articles of manufacture of given form which are made of one piece of wire or other suitable material and have a loop and two hooks one upon the other, and consists in making the snap hook of wire or other suitable material of oval form, which imparts important advantages to the snap hook not possessed by any snap hook heretofore made of wire or containing a separate spring.

This invention relates, thirdly, to snap hooks and other similar articles of manufacture of given form, and consists in making the snap or other article of flat wire or other suitable material, and forming the tongue or spring of the article in one piece with the body.

A.D. 1875, March 2.—No. 767.

JOHNSON, John Henry, of 47, Lincoln's Inn Fields, in the county of Middlesex, gentleman.—(*A communication from Francis C. Nye, of New York, in the United States of America.*)—"Improvements in " machinery or apparatus for the manufacture of snap-hooks, which improvements are also applicable " to other similar purposes."

This invention relates to machinery which is more particularly designed to make wire snap hooks in which the loop and sides stand in a plane at right angles to the hooks with the arms crossing each other, but the construction of the machine may be modified without changing its principle so as to make snap hooks and similar articles of all sizes with or without one or more middle bends in the arms of the snap hook, with the loop of a round, square, or other form, and adapted to a strap or link of any desired width or diameter, with the loop or the swell in the arms round or flattened and made of wire of a round, half round, oval, square, or other form, or of other flexible material of requisite strength and elasticity.

The invention is, however, particularly applicable to the production of wire snap hooks or similar articles in which the arms cross each other, or the plane of the hooks is at right angles with the plane of the loop or eye, or one hook is exactly concentric with the other, or both hooks are of the same size, or in which the arms are respectively sprung up and down, preserving the elasticity of the wire.

The invention also embraces apparatus for feeding the wire, cutting it into lengths, and milling its ends, which is applicable to the preparation of wire for other purposes than snap hooks.

A.D. 1875, March 2.—No. 768.

CROCKER, Samuel Leonard, of the state of Massachusetts, of the United States of America.—" A new and useful improvement or process of smelting and refining copper ores and metallic " copper."

This complete Specification describes a process which consists in adding zinc in small quantity in a furnace to the copper ore or ores, or to the partially refined metallic copper therein containing arsenic and antimony, whereby these impurities can be readily removed.

A.D. 1875, March 2.—No. 769.

FIRTH, William, of Burley Wood, near Leeds, in the county of York, esquire.—" Improvements in " machinery for sinking shafts or pits, and for the driving or cutting of tunnels."

This Provisional Specification describes improvements in the mining machine described in the Specification of a Patent No. 2977/61.

The machine is mounted upon a circular table with guide rails upon it. The machine is able to travel around the table, and as it travels it cuts a circular ditch or groove, isolating a central block of rock. When the machine has been removed the central block of rock is blasted and the operation of cutting is then repeated.

A.D. 1875, March 2.—No. 770.

CLARK, Alexander Melville, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Edouard Armand Robert d'Hurcourt, of Paris, France.*)—" Improvements in " gas meters."

The invention consists in the employment of pairs of oscillating gas measuring chambers, dipping in water and working in separate compartments, the chambers communicating with opposite compartments in which the gas is caused to alternately flow in and out by slide valves, the measuring chambers being alternately filled and emptied.

Instead of slide valves oscillating hydraulic valves of the particular construction of this invention may be used, whereby friction is reduced to a minimum.

A.D. 1875, March 2.—No. 771.

NEWTON, Alfred Vincent, of the Office for Patents, 66, Chancery Lane, in the county of Middlesex, mechanical draughtsman.—(*A communication from Henry Metcalf, of Springfield, in the state of Massachusetts, United States of America.*)—" Improved means for holding and carrying cartridges."

This invention relates to an improved mode of carrying cartridges, the object being to make them readily accessible to the soldier when in action or when suddenly called upon to use his rifle. The cartridges are fitted into wooden blocks of a convenient size having, say, eight cylindrical recesses to receive as many cartridges.

A.D. 1875, March 3.—No. 772.

GROVER, John William, of No. 9, Victoria Chambers, Westminster, in the county of Middlesex.—" Improvements in the manufacture of spring-washers, and apparatus therefor."

This invention relates to the manufacture of spring or elastic washers such as were described in the Specon. to a Patent granted to the said J. W. Grover on the 3rd April, 1873, No. 1230.

According to this invention a piece of metal rod cut to length with bevilled ends is inserted between a mandril and the edge of a disc and between two helical faces which are pressed together by a screw; and the disc being then made to revolve round the mandril, the piece of rod is coiled into the form of a helical washer, which drops out of the machine on relieving the side pressure.

A.D. 1875, March 3.—No. 773.

FREIR, Alexander, and FAIRLIE, Frederick, both of Dundee, in the county of Forfar, North Britain.—"New or improved bobbins used in the manufacture of yarns."

The feature of novelty which constitutes this invention is the construction of the said bobbins in the manner and of the material set forth.

A.D. 1875, March 3.—No. 774.

SEARLE, Richard, of No. 23, Amhurst Road, Hackney, in the county of Middlesex, gentleman.—"Improvements in rails and their connections used for the purpose of a road or other surface for "wheels to run on."

The invention consists in the use of a key passing through the ends of rails by openings formed in each, whereby the pressure upon the end of one rail is communicated to the end of the other rail, so that the ends of two rails in conjunction are depressed equally at the same time.

The invention also relates to fixing fish plates by means of keys of a wedgelike form.

A.D. 1875, March 3.—No. 775.

GOOCH, Sir Francis Sherlock, Baronet, of No. 7, Upper Grosvenor Street, Grosvenor Square, in the county of Middlesex.—"Improvements in regulating the flow of liquids in apparatus employed for "reducing such liquids from a higher to a lower temperature."

The invention applies to cases in which as in brewing operations it is desirable that the liquid under operation be progressively cooled in such manner that at the point of delivery it may be kept at about the temperature desired.

The invention relates to improved arrangements of electrical means, by which to render this regulation self-acting.

For this purpose in the case of the operation of brewing, one or more electro thermometers are applied in the tun or in the pipes or passages leading thereto, such electro thermometer or thermometers being in connection with an electro magnet or magnets of comparatively small power placed in position to operate upon an armature or lever or levers, by which contact will also be formed with another wire to complete the circuit to the poles of a more powerful magnet, the armature of which operates to control the flow of the liquor under operation in its passage through the refrigerator or the flow of the refrigerating media, so as to vary the one to the other, and thereby obtain the desired temperature.

A.D. 1875, March 3.—No. 776.

MESDACH, Louis, of the firm Oeschger, Mesdach, and Co., of Paris, manufacturer.—"An improved "apparatus for accumulating hydrostatic pressure."

According to this invention an "accumulator" is constructed with the cylinder and plunger inverted, the plunger being fixed on a pedestal foundation while the cylinder moves up and down over the upper end thereof. The loaded tank is formed with its bottom bulged up to a considerable extent, being thus in great part of annular form, and it is suspended from the lower end of the cylinder by the central part of the bulged up bottom, so that the centre of gravity of the tank is always below its point of suspension, and the use of guides is thus dispensed with. Manholes are provided through the annular part of the tank to gain access to the packing of the cylinder.

A.D. 1875, March 3.—No. 777.

BONNEVILLE, Henri Adrien, of the British and Foreign Patent Offices, 18, Rue de la Chaussée d'Antin, Paris, France, and 6, Piccadilly, in the county of Middlesex, patent agent.—(*A communication from Celestin Martin, a person resident at Verviers, in the Kingdom of Belgium.*)—"A new and improved "spindle for fixed machines for spinning wool and fibrous materials in general."

The invention consists in the combination of a stationary solid spindle with a moveable hollow spindle placed and turning on it and an oil reservoir for lubricating automatically the said spindles.

A.D. 1875, March 3.—No. 778.

TURNER, Charles, and PAGE, Henry, both of Lenton, in the county of Nottingham, machinists.—" Improvements in machinery and apparatus for fleshing, scouring, shaving, scudding, burring, " striking out, grounding, frizing, or removing wool or hair from hides or skins."

The inventors perform the several operations of fleshing, scouring, shaving, scudding, striking out, grounding, frizing, or removing hair or wool from hides or skins by means of knives, scrapers, or other instruments, each of which are caused to revolve on a sliding block moving from end to end of a bed, or if two blocks are used they move simultaneously from the centre outwards and back; the blocks may be arranged to slide horizontally, inclined, or vertically.

A.D. 1875, March 3.—No. 779.

LAYCOCK, Peter, of Leeds, in the county of York.—" Improvements in machinery or apparatus " employed in cutting or pulverizing flocks or mungo for flocking purposes."

Within a cylinder or drum there is a spiral or other knife caused to rotate at a great speed and the drum at a slow speed.

The mungo or flocks placed in drum are carried to cutter and so cut up. In drum there are shelves.

A.D. 1875, March 3.—No. 780.

LAWSON, George, of Crowton, Northwich, in the county of Cheshire, contractor.—" Improvements " in machinery for excavating and removing excavated materials."

This invention consists in an endless chain of buckets driven and carried round over a polygonal chain pulley at top and bottom of a frame, or arranged to turn on a turning table on a strong rectangular carriage, made to travel on the usual temperory rails laid in the botton of the " cutting " as formed, on which the trucks or waggons also run, which carry away the excavated materials when filled by this new machine. The lower end of the frame projects beyond the sides of the turning table and carriage down to the bottom of the " cutting," while the upper end and driving pulley project to the other side of the carriage, with the steam boiler and engine secured to the sole framing so as to balance the weight of the whole swivelling frame with its chain of buckets. The horizontal crank shaft of the engine gives motion to a bevelled wheel on the spindle of the upper chain pulley, through an angled side shaft and pinions by an arrangement of clutches and hand lever mechanism. The excavators (or workmen) cut the earth and stones and shovel them down into the lower buckets to be removed.

A.D. 1875, March 3.—No. 781.

LIPMAN, Henry, in the employment of " Messrs. Lipman & Co.," of Dundee, in the county of Forfar, North Britain, bag manufacturers.—" A new or improved mode of protecting tea chests, and " means employed for that purpose."

This invention consists in the manufacture and employment of ready made coverings or wrappers for tea chests for protecting them from injury in shipment and transit from one place to another. The coverings are made of textile fabric, preferably of flax, jute, hemp, or cotton woven in widths suitable for the several sizes of tea chests, and are either sewn into the shape of square bags or laced as desired. Such wrappers may be used over and over again, thus effecting great economy.

A.D. 1875, March 3.—No. 782.

MILLS, Benjamin Joseph Barnard, of the firm of Harris and Mills, of 23, Southampton Buildings, in the county of Middlesex, patent agent.—(*A communication from Charles G. Conn, of Elkhart, in the county of Elkhart and state of Indiana, in the United States of America.*)—" Improvements in mouth- " pieces for musical instruments."

The invention consists in constructing the mouthpieces of wind instruments with an elastic face where the mouthpiece comes in contact with the lips.

A.D. 1875, March 3.—No. 783.

GODDARD, George Owen, of Brighton, in the county of Sussex.—" Improvements in roller skates."

This relates to that class of skates known as roller-skates, and consists in the construction and arrangement of mechanism for giving " play " to the wheels.

A.D. 1875, March 3.—No. 784.

WHYTE, John, of Glasgow, machine agent.—" Improvements in looms for weaving."

This invention relates to improved mechanism for operating the rising and falling and the circular shuttle boxes of looms employed for weaving checked and fancy pieces ; and the invention also relates to an improved apparatus or " escapement " for preventing breakage or damage to the loom, when an obstruction to the free working of the loom arises.

A.D. 1875, March 3.—No. 785.

ELLIS, John, of the City Road, in the county of Middlesex.—" A new or improved inhaler for " invalids."

The novelty of the invention consists in forming an inhaler of a conical shape in two parts, the upper portion of which forms the cap for the lower portion.

The apex of the cone is provided with a suction pipe, and the lower portion of the vessel with an inlet induction pipe, through which the air enters and passes through the liquor to the lungs.

A.D. 1875, March 3.—No. 786.

SUGG, William Thomas, of Vincent Works, Vincent Street, in the city of Westminster.—" Improvements in lamp burners."

This invention relates to paraffin oil burners, and consists, firstly, in making the wick holder or upper part thereof of porcelain, steatite, glass, or other non heat conducting material ; or of making slits on the upper part of the wick case, or of severing the wick tubes and joining them together by wires, leaving an intervening space between the upper and lower part of the wick holder.

Secondly, in surrounding the wick holder with a case or gallery wherein perforations are made, and so arranged that while one current of air passes to the flame through the central tube, another passes up outside the wick case and between it and the cone to the exterior of the flame. In addition to these currents, by the attachment of an upper gallery another current of air is induced to pass up outside the cone and between it and the chimney.

By the adoption of these improvements a greatly increased light will be the result.

A.D. 1875, March 3.—No. 787.

SHRIMPTON, Zaccheus, of Redditch, in the county of Worcester, manufacturer.—" Improvements " in crochet needles."

This invention consists in taking a crochet needle having a hook at each end and hinging it centrally by a pin in the top of the handle which is made in several ways.

The improvements further relate to two or more single crochet needles hinged by a pin, and having a loose sheath which becomes a part of the handle in use.

The invention also refers to improved crochet needles propelled from their handles, and to the formation of crochet needles from a single piece of wire.

A.D. 1875, March 3.—No. 788.

TALLIS, Charles, wine merchant, and **CAVE, Elias**, aerated water manufacturer, both of the parish of Saint Helier, in the island of Jersey.—" Improvements in bottles for containing aerated or other " liquids, and in closing or stopping the same and extracting the liquids therefrom, and in machinery " or apparatus for filling such bottles."

This invention relates to that class of apparatus for closing or stopping bottles for containing aerated or other liquids wherein the liquid is retained by a disc, flange, or ball of india rubber or other elastic or flexible material bearing or pressing against an internal shoulder in the upper part of the bottle, and is released by the act of depressing the stopper ; and it consists more particularly in the employment of an improved stopper, and in the combination with the stopper of a peculiar shaped bottle, whereby the defects to which apparatus of this class are liable are obviated, and increased facility is afforded for extracting the liquid from the bottle.

A.D. 1875, March 3.—No. 789.

CRAMPTON, Thomas Russell, of 4, Victoria Street, in the city of Westminster.—" Improvements in " revolving furnaces, and in apparatus connected therewith.

This Specification describes making the wearing rings which form a joint between the revolving and non revolving parts of the furnace of numerous short segments, so that they shall not be injuriously distorted by contraction and expansion. In some cases each of the small segments may have a portion of it exposed to the water in the water casings. The Specification also describes carrying off the air and water from the upper part of the water casing of revolving furnaces through pipes, which are led from points near to and at distances around its circumference to a central cock, which closes the passage through them except when their outer ends are above the top of the inner casing, so that the inner casing shall always be covered with water. A continuous supply of water being admitted to the water casing by a pipe passing centrally through the cock. The Specification also describes means of renewing continuously the lining of revolving furnaces in which powdered fuel is burnt, and which are employed for heating steam boiler furnaces and other apparatus, and also means of maintaining a constant supply of powdered fuel in the feeding chambers from which the fuel is supplied by feeding apparatus in revolving furnaces.

A.D. 1875, March 3.—No. 790.

COLLIER, John, carpet manufacturer, and **MARSDEN**, John, mechanic, both of Halifax, in the county of York.—" Improvements in looms."

This invention has for its object improvements in looms, and relates to looms in which several shuttles carrying different colors of weft are employed. Our arrangement is such that the shuttles can be taken in any desired order, and that for each pick any one of all the shuttles employed may be made use of. The shuttle boxes are arranged in two vertical tiers at each end of the batten, one is the front the other the back tier; there may be four, five, or other number of boxes in each tier. Any one of the shuttle boxes in either tier can be brought to the level of the shuttle race by raising or lowering the tier of boxes; and the tiers of boxes can be moved forward or drawn back, so that either the front tier or the back tier at pleasure can be brought to correspond with the shuttle race.

A.D. 1875, March 3.—No. 791.

LAWRENCE, John Emmett, and **PORTER**, Edmund Vernon, both of 36, Parliament Street, Westminster.—" Improvements in centrifugal pumps."

This invention has for its object improvements in centrifugal pumps, and the improvements relate to that class of centrifugal pumps in which a revolving disc or wheel draws in water at its centre on both sides and discharges it at its periphery into a volute or delivery passage which surrounds it and thence into a discharge pipe, and in which also two suction pipes or passages are led up from the bed on opposite sides of the volute and terminate opposite to the centre of the revolving disc or wheel to deliver water to it.

A.D. 1875, March 3.—No. 792.

WISE, William Lloyd, of Chandos Chambers, Buckingham Street, Adelphi, in the county of Middlesex. —(*A communication from Théodore Masui, engineer, of No. 2, Chaussée de Louvain, Brussels, Belgium.*)— " Improvements in electric brakes for railway carriages and waggons."

This invention relates to an arrangement of break in which a drum is brought into operation by means of discs in conjunction with electric magnets. The levers actuating the brake blocks are carried through chains.

A.D. 1875, March 3.—No. 793.

JUSTICE, Philip Syng, of 27, Southampton Buildings, Chancery Lane, county of Middlesex, merchant.—(*A communication from Thomas Shaw, of Philadelphia, Pennsylvania, United States of America.*)—"Improvements in valves."

My invention consists in the construction of a valve with a plunger or piston head projecting from its seat for the purpose and in manner hereafter described, and in the provision of a hydraulic packing above the top of the valve. The object of the invention being to enable a rapid stroke of the valve under high pressures without danger from pounding or injuring the seat of the valve.

A.D. 1875, March 3.—No. 794.

DOBSON, Thomas, of 6, Lord Street, Liverpool.—"Improvements in machinery for cutting and "paring linseed oil cakes and other similar substances."

This Specification describes a mode of cutting and trimming the edges of the cakes by means of 2 pair of knives, one pair being stationary and the other reciprocating. One of these pairs of knives is made adjustable and is pressed together by springs, but follows the guidance of a form above which the cake is fixed. A self acting vice holds and releases the cakes, and each cake as it passes through the machine, after being operated on by each pair of knives in succession, is carried off on an endless band.

APPENDIX

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX,

CONTAINING THE

Abridgments open to public inspection before the expiration of the term of six months (in consequence of the Patentees having filed their Final Specifications), and also the Abridgments of Complete Specifications received from August 28 to September 3, 1875. These Abridgments will be subsequently printed in the body of the book, in order to preserve the numerical and chronological arrangement.

A.D. 1875, March 4.—No. 798.

ADAMS, Robert, of 25, Falmouth Road, Great Dover Street, Southwark, in the county of Surrey. —"Improvements in spring hinges or door springs."

The method of applying the springs to prevent more effectually the slackness arising from wear, and for their ready removal when injured without displacing the hinge bar and a new and simple method of adjusting the door.

A.D. 1875, March 4.—No. 800.

PARE, Henry Burton, of Bolton, in the county of Lancaster.—"An improved cap for feeding or "other bottles."

This invention is designed principally to be applied to such infants' feeding bottles as are provided with an elastic tube, and is intended to be used as a substitute for the earthenware cap and cork usually employed to close the mouth of the bottle and carry the tube.

For this purpose I make a cap of pure india rubber to fit over the neck of the bottle.

A.D. 1875, March 4.—No. 802.

LAWSON, George, of Crowton, Northwich, in the county of Cheshire, contractor.—"New or im-"proved modes and means of constructing rails for railways."

This invention consists in forming the rails for railways in two halves with tongue and groove joints up and along the middle of their vertical web, and bolting them together into a continuous rail, with the end joints of the half rails on the one side placed in the middle (or "breaking joint" or "bond") with those of the others, by screw bolts passed through slightly oval or oblong holes in their webs and a short fish plate at each end joint, to secure all firmly into one continuous rail which would allow for its expansion and contraction.

A.D. 1875, March 4.—No. 805.

LAYCOCK, George, of Whittington, in the county of Derby, dyer.—"Improvements in the mode "of controlling horses by the use of magnetic electricity."

To stop or retard the speed of horses by magnetic electricity by means of a communication with a magnetic machine or galvanic battery and passing a current through the mouth or different parts of the animal.

Also to urge the animal to increased speed by similar means applied to different parts of the animal.

A.D. 1875, March 4.—No. 810.

JOHNSON, Samuel Henry, of Lea Bank Works, Warton Road, Stratford, in the county of Essex.— "Improvements in the method of and apparatus for the manufacture of glucose."

According to this Provisional Specification grain suitably impregnated with acid is treated with steam in such manner that the steam may permeate amongst the grain and so rapidly bring it to the temperature at which the conversion takes place.

A.D. 1875, March 5.—No. 817.

BOMFORD, Ernest George Cook, of Fladbury, near Pershore, in the county of Worcester, farmer.—" New or improved machinery or apparatus to be attached to certain kinds of reaping machines for " the purpose of binding into sheaves or bundles wheat or other grain cut by the said machines."

This invention consists of mechanical combinations to be applied to self delivering reaping machines, by which a loop of string is formed and is passed on to the sheaf to be tied, its ends twisted together and forced into the sheaf, the sheaf being so tightly bound by the loop that the twisted ends of the loop forced into the sheaf are retained there securely. The loop is formed by a rotating arm or looper, a pair of jaws on which take hold of the string. A pair of cutting forceps, carried by an endless band, cut off the string and grip the loop by its ends. The carrying of the loop around the sheaf is effected by the pair of forceps and a screw. The ends of the loop are twisted by the rotation of the forceps, and the twisted ends of the loop are forced into the sheaf by a spring acting on the carrier of the forceps, thrusting them into the sheaf. The motion of the several moving parts is taken from the reaping machine by means of gearing.

A.D. 1875, March 6.—No. 833.

FARNSWORTH, Samuel, of Mansfield, in the county of Nottingham, engineer.—" Improvements in " valve apparatus for controlling the passage of water or other fluids."

The object of the invention is to arrange the parts that, whilst the passage for the flow of the water or other fluid may be fully closed when desired, a clear and uninterrupted way may be obtained for the flow of such liquid or fluid when desired by the valve and parts acting therewith for closing such passages being then taken fully out of the course of the current.

For this purpose the valve is connected by pin joint with a lever arm working in a chamber of sufficient size for the purpose.

The valve is opened by screw wheel acting on a rack applied internally to the valve lever or externally to the axis of that valve.

A.D. 1875, March 6.—No. 835.

PILBROW, James, of Tunbridge Wells, in the county of Kent.—" A new or improved construction " of skate or apparatus adapted for use upon artificial ice or other smooth surface."

The skate instead of being made to run on rollers like a carriage is passed along upon a series of separate balls, the skate resting upon only about two balls at a time, such balls being contained in an upper and lower tube connected at the toe and heel parts of the skate, and being free to pass from toe to heel and return from heel to toe. Also the principal part of the lower tube (analogous to the sliding edge of the common ice skate upon ice) is formed on a curve, to present the balls on a curved line vertically on the floor or prepared surface.

A.D. 1875, March 6.—No. 841.

PARKES, Alexander, of Gravelly Hill, Erdington, in the county of Warwick, manufacturer.—" Improvements in furnaces for metallurgical operations, which improvements may also be applied to " steam boiler and other furnaces."

This invention consists essentially of a chamber or generator in which gaseous fuel, consisting mainly of carbonic oxide is generated, the gaseous fuel being conducted over a hollow bridge or hot air flue into a reverberatory chamber in which copper is smelted, or the puddling of iron or other like metallurgical operation is carried on. The hot air from this bridge or flue mixing with the gaseous fuel effects its combustion and produces an intense heat in the reverberatory chamber. The air supplied to the hollow bridge or hot air flue is heated by passing through the walls of the generator which are reticulated or honeycombed. The waste heat from the reverberatory chamber may be utilized by being passed to a second or cementing chamber, and from thence to a boiler for the generation of steam. The gas generator and hot air bridge may be applied to steam boiler and other furnaces unconnected with metallurgical furnaces.

A.D. 1875, March 9.—No. 864.

BYWATER, William, of the Sweet Street Foundry, Holbeck, Leeds, in the county of York.—"Im-
" provements in apparatus for effecting the drawing, spinning, and twisting of flax, wool, cotton, silk,
" and other fibrous substances."

This invention relates to improvements on 2814/70 by imparting a uniform elastic pressure to the ends of the axis of the pressing roller by plate spring formed with recesses to receive those ends, and forming the surface of this roller plain or cut or covered with elastic substance.

A.D. 1875, March 10.—No. 880.

MORTON, William Walter, of No. 24, Charlotte Street, Caledonian Road, in the parish of St. Mary, Islington, in the county of Middlesex, gun maker.—"Enabling a soldier, volunteer, or other person
" to use the Snider or any other rifle for the purpose of practising aiming at a shorter range than
" could be obtained by using an ordinary cartridge."

For enabling a smaller cartridge to be used with a breech loading rifle than for which it was originally made.

A.D. 1875, March 11.—No. 900.

ELLIS, William, of 73, Northcote Road, Wandsworth, in the county of Surrey, gentleman.—"Im-
" provements in machines for boring rocks or other hard substances."

This invention relates to machines in which a jumper or drill is carried to and fro, so as to bore rocks or other hard substances by a succession of blows.

By an arrangement of the parts actuating the valve or valves, the stroke may be lengthened or shortened, and the motive fluid may be made to cushion the piston at the end of each stroke, may be cut off at any part of the stroke, or may be used expansively.

The jumper or drill is rotated at each backward stroke by an arrangement which prevents breakage in case of the jumper or drill jamming in a hole. The cylinder may be automatically fed forward in proportion as the jumper or drill penetrates the rock.

The machine is attached to a stand or bar by an improved universal joint, which allows the machine to be pointed in any direction, and to be readily removed.

The hollowed out end of the piston rod is so arranged as to firmly grip the jumper or drill without the sides wearing unequally.

One form of stand on which the machine may be mounted is arranged so as to be suitable for very uneven ground.

A.D. 1875, March 19.—No. 1022.

BOIRE, Emile, of the firm Baudet et Boire, of Lille (Nord), France, engineers.—" Improvements in
" steam engines."

This invention consists, first, in improved means of distributing steam in steam engines, with the employment of slide valves having a plane face combined with catches or clicks. Secondly, in the employment for this system of distribution of the action of steam in lieu of springs or counterweights. And, thirdly, in an apparatus for indicating generally the working of the engine.

A.D. 1875, April 1.—No. 1179.

MAC LELLAN, Walter, of the firm of P. and W. MacLellan, of Glasgow, in the county of Lanark, iron merchants.—(*A communication from Edward Goodman Sheward, of Negapatam, India.*)—"Im-
" provements in screw jacks."

This invention consists in constructing screw jacks with a double casing and central screw in combination, so as to obtain with a screw jack of a given height nearly double the lift, which is obtained by using screw jacks of ordinary construction.

A.D. 1875, April 9.—No. 1282.

WAKEFIELD, John, engineer, of the Vulcan Foundry, Brynmawr, in the county of Brecknock, Wales.—" Improvements in regulating and working the slide valves of steam and other engines."

This invention consists in links attached to the eccentric rod and also to bell crank, which is jointed to the slide valve rod. The eccentric rod is connected with a shaft bearing the reversing lever, and by this arrangement the travel of the slide valve is regulated with great precision.

A.D. 1875, August 28.—No. 3030.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from Joseph Gandolfo, sugar refiner, and John William Jarboe, manufacturer, both of Brooklyn, in the county of Kings and state of New York, United States of America.*)—" Improvements " in apparatus for burning or revivifying and for otherwise treating bone-black or other substances, " and in apparatus for moulding or compressing sugar."

This invention consists of a revivifier for bone black, in which the products of combustion are conducted from the furnace into the lower end of a tube that extends lengthwise through the vertical retort and communicates with the chimney, so that the bone black will be exposed to a double heating surface. With this arrangement is combined a peculiar socket that receives the lower end of the retort and central smoke flue. The invention also consists in a cooler or heater for the bone black, in which an inclined rotary drum having inwardly projecting blades is applied around a stationary vessel which is traversed by water or steam pipes or shelves.

The invention also consists, with reference to the mechanism for pressing centrifugal machine sugar into blocks or cubes, in the combination of a series of stationary moulds that are open at both ends with a series of dies or plungers that fit said moulds, and with a sliding bottom beneath said moulds, and an endless or other carrier beneath said bottom. A heating apparatus is combined with the carrier to heat the pressed sugar while the same is on the carrier; and the plungers are provided with wipers that clean the moulds in ascending.

A.D. 1875, August 30.—No. 3037.

DUDGEON, ARTHUR, of No. 22, Great George Street, Westminster, London, S.W., and No. 163, Great Brunswick Street, Dublin, engineer.—" Improvements in the distillation of spirituous and other " liquors, and in apparatus to be employed therefor."

This invention consists of improvements upon the invention of George Johnston, which said invention of the said George Johnston forms the subject of the Patent, No. 1568, dated 20th May, 1869.

A.D. 1875, August 31.—No. 3055.

PALING, THOMAS HENRY, of Loughborough, in the county of Leicester, manufacturer.—(*A communication from Samuel Paling, of the town of Woodstock, in the county of Oxford, in the province of Ontario, in the Dominion of Canada, carpenter.*)—" New and useful improvements in window blind and curtain " rollers."

The application and arrangement to flexible blind or curtain of a roller upon whose journals or ends are wound side cords communicating with a heavy tassel or weight so arranged as to counterbalance the roller.

A.D. 1875, August 31.—No. 3063.

CLARK, ALEXANDER MELVILLE, of 53, Chancery Lane, in the county of Middlesex, patent agent.—(*A communication from John Savage Hawley, of Stapleton, in the county of Richmond and state of New York, United States of America.*)—" An improved device for clearing the vents or discharge pipes of " washbasins and other similar receptacles."

The invention consists in an improved vent clearer, formed by attaching a rubber cup to a handle, the cup being placed over the discharge orifice of the vessel with a small quantity of water beneath, and the handle then forced suddenly downwards, whereby the water is forced into the discharge pipe and the obstruction dislodged.

A.D. 1875, September 1.—No. 3066.

CRABTREE, WILLIAM, loom maker, of Bradford, and **HANSON, WILLIAM**, engineer, of Ovenden, near Halifax, both in the county of York.—Improvements in looms for weaving, and in apparatus " connected therewith."

Firstly. The employment and construction of self acting apparatus for delivering the warps at any required pressure or tension as the weaving operation proceeds.

Secondly. The means or method of giving the required pressure or tension by screws acting on springs and working breaks; also in the means of taking off the pressure by unscrewing the screw as the weaving operation proceeds.

Thirdly. The means or method of working a peg wheel in conjunction with a star wheel and spring, thereby preventing the turning back of the peg wheel.

Fourthly. The employment and construction of a pull back motion, acting on gear working the warp beam.

A.D. 1875, September 1.—No. 3070.

LAKE, William Robert, of the firm of Haseltine, Lake, & Co., patent agents, Southampton Buildings, London.—(*A communication from Joel Herbert Shedd, of Providence, and Stephen Arnold Jenks, of Pawtucket, both in Rhode Island, United States of America.*)—" Improvements in liquid meters which " may also be used as pumps or motor engines."

The said invention relates to an apparatus for measuring liquids, and capable also of being used as a pump or as a motor engine consisting of the following elements or organisms in combination: a close cylindrical chamber provided with an inlet for the admission of the stream of liquid and an outlet for the discharge of the contents of the cylinder. These radial blades severally mounted so as to revolve around the common central axis of the cylinder within the chamber: and a driving shaft combined with said blades by systems of gearing as described or the equivalent thereof whereby the said blades shall be enabled to revolve severally in the same times, but relatively to each other at different rates of speed, so that each shall act successively as a plunger when the apparatus is used as a pump or as a meter or act as a wheel float, when the apparatus is used as an engine and as a diaphragm to separate the incoming stream from the outflowing discharge.

A.D. 1875, September 1.—No. 3072.

COLEMAN, Charles Carson, machinist, of San Francisco, California, United States of America.— " A machine and process for preparing ramie and other fibre from the plant stalks."

This invention relates to an improved machine and process for preparing the fibre of ramie, flax, and other textile substances directly from the stalk, so that it shall be presented in marketable form of one single operation.

This machine consists of a series of alternate fluted and plain rollers through which the stalks are passed to be crushed, being led by suitable belts from one set of rollers to another.

From these rollers the crushed material is passed between belts, which carry it into and through a tank or bath of hot water or steam for the purpose of freeing the fibre of the glutinous or gummy substance contained in it, after which it is again passed between pressing rollers which press out the gummy substance.

From these rollers it passes from a second tank and rollers, the solution being varied if desired by the introduction of certain chemicals. After a final washing and pressing the fibre is passed into a drying chamber, and lastly, between heated rollers which deliver it free from all gummy matter and nearly free from stalks, the fibre being quite white and in a marketable condition.

A.D. 1875, September 3.—No. 3088.

DITTMAR, Carl Friedrich Wilhelm Ernst, of the state of Massachusetts, of the Republic of the United States of America.—" An invention having reference to explosive compounds and the " manufacturing thereof."

First. This Complete Specification describes one or more new or improved articles of manufacture or explosive compounds made from vegetable fibre converted to pulp and treated with acids or such and one or more other matters.

Second. Processes or modes of treating vegetable fibre for the purpose of rendering it explosive, such consisting in reducing the fibre to pulp, desiccating and reducing such pulp to grains or powder or compact forms, and treating such with acids and one or more other materials in the manner set forth.

INDEX OF NAMES

TO

CHRONOLOGICAL AND DESCRIPTIVE INDEX FROM JAN. 1 TO MAR. 3, 1875,

AND TO

APPENDIXES FROM MAR. 4 TO SEPT. 3, 1875.

[The names printed in *Italic* are those of the persons by whom the inventions have been communicated to the Applicants for Letters Patent. The consecutive numbers of the Applications, which are prefixed to the Abridgments contained in this volume, follow the names. The names distinguished by this addition (*App.*) belong to the Abridgments in the Appendixes. The Appendixes Nos. 36 to 52 were published with the corresponding weekly Nos. of the Chronological and Descriptive Index for the year 1874, and the Appendixes Nos. 1 to 10 with the weekly Nos. of the Index for the present year.]

A.

Abbott, J., & Gidlow, T., 655, Feb. 23, Steam-boilers [and furnaces.
Abel, C. D. (*Daimler*), 71, Jan. 8, Motor engines.
——— C. D. (*Smith & Smith*), 244, Jan. 22, Steam-boilers.
——— C. D. (*Meunier*), 1433, Apr. 20 (*App.* 43.) Flapped [axles.
——— C. D. (*Mathian & Solet*), 1545, Apr. 27 (*App.* 44.) [Heating air, &c.
Absalom, W., & Griffiths, E., 151, Jan. 14, Steering ships.
Acheson, G., & Kennedy, W., 40, Jan. 4, Spinning.
Ackerman, B., 502, Feb. 10, Fertilizers.
Adams, R., 798, Mar. 4 (*App.* 10.) Spring hinges or [door springs.
Adamson, W. (Johnson), 381, Feb. 2, Starch, &c.
Adie, P., 421, Feb. 4, Clipping horses, &c.
Alexander, E. P. (*Benwell & Humphreys*), 196, Jan. 19, Bale bands.
——— E. P. (*Barker*), 1633, May 3 (*App.* 45.) [Railway brakes.
——— J., 674, Feb. 24, Compressing engines.
Alfieri, E., & Dumont, A., 512, Feb. 11, Lockets.
Alison, J., 957, Mar. 15 (*App.* 47.) Steam-boilers.
Allan, G., & Brown, J. W., 525, Feb. 12, Electric tele- [graphs.
——— W., 297, Jan. 26, Drilling machines.
——— W., & Johnson, S., 191, Jan. 18, Heating feed- [water; condensing steam.
Allen, C. B., & Fawcett, T. C., 645, Feb. 22, Brickmaking.
——— W., 269, Jan. 23, Raising and forcing fluids.
Allibon, G., Manbré, A., & Beldam, W. A., 264, Jan. 23, [Steam-boilers.
Alston, W., 171, Jan. 16, Adjustable chairs, &c.
American Sewing-Machine Co., Hamburg- (Jensen), 26, [Jan. 22, Printing metals.
Anderson, G., 2843, Aug. 12 (*App.* 7.) Gas; supplying gas.
Ankers, J., 2593, July 21 (*App.* 4.) Lubricating axles.
Antisell, T. M., & Bruce, De V., 2016, June 16 (*App.* 49.) [Vapor and gas-engines.
Armstrong, J., 142, Jan. 14, Railway switches.
Arnold, L., & Kidd, J., 66, Jan. 7, Gas.
Arnold, W., 593, Feb. 18, Metal wheels.
Ascough, W., 690, Feb. 25, Combined bevel, square, [protractor, &c.
Asher, G., 665, Feb. 23, Soldering irons.
Aspinwall, E. O., 249, Jan. 22, Candle and lamp wicks.
Aston, A. J., 609, Feb. 18, Solitaires, studs, &c.
Atherton, J., 396, Feb. 3, Pipe joints, &c.
——— W., & Lomax, J., 699, Feb. 25, Looms.
Atkin, R., 92, Jan. 11, Life-boats, rafts, &c.
Atkins, J., 666, Feb. 23, Metallic bedsteads and cots.
Atkins, J., & Torr, C. W., 594, Feb. 18, Gasaliers, chan- [deliers, &c.
——— T., 527, Feb. 12, Ventilating.
Aubertin, E., Boblique, L., Leplay, H., & Box, J., 181, [Jan. 16, Phosphates and phosphorus.
——— E., Boblique, L., Leplay, H., & Box, J., 214, [Jan. 20, Disinfecting sewage, &c.
Avery, H. G., 589, Feb. 18, Dress suspenders.
Aylesbury, H., 262, Jan. 23, Bottle stoppers.
Ayton, P. E., 84, Jan. 9, Attaching knobs to spindles.

B.

Badcock, J., 280, Jan. 25, Ladies' dress improver.
Baffoy, P. H., Dupré, P. S. E., Rogé, H. N., & Poret, E. [(Clark), 288, Jan. 25, Preserving woven fabrics.
Bailes, R., & Hallsworth, S., 573, Feb. 17, Treating sewage.
Bailey, W. H., 539, Feb. 13, Steam-boiler fittings.
Baillie, R., & Westwood, J., 341, Jan. 29, Corrugated [iron plates.
Baird, J., & Brown, J. F., 258, Jan. 23, Weaving.
Bairnsfather, S., 613, Feb. 19, Signalling on railways.
Baker, D., 1577, Apr. 29 (*App.* 44.) Mariners' compasses.
——— J. M. B., 86, Jan. 9, Drying steam-boilers.
——— R., 62, Jan. 7, Jacquards.
——— W., 327, Jan. 28, Purifying iron.
Balestrieri, P. (Clark), 89, Jan. 9, Collecting rays of [light and heat.
Ball, C. J., & Richardson, J., 564, Feb. 16, Combined [engine, &c., and air compressor
Bannister, R. D., & Milligan, S. (Lake), 2245, June 18 [(*App.* 51.) Device for advertising.
Bañolas, R. (Johnson), 138, Jan. 13, Extinguishing fires.
Barker, A. (Alexander), 1633, May 3 (*App.* 45.) Railway [breaks.
Barker, J., 432, Feb. 5, Hoists or cranes.
Barlow, H. B. (*Stratton*), 407, Feb. 3, Indicating water- [level, &c.
Barron, W. S., & Britten, F. J., 118, Jan. 12, Centrifugal [apparatus.
Bates, G., 660, Feb. 23, Attaching main cocks, &c., to [service pipes.
Bates, F. L. (Clark), 1639, May 3 (*App.* 45.) Locking [screw nuts.
Bath, J., 369, Feb. 1, Coupling railway carriages.
Battersby, J., & Wilson, W., 375, Feb. 2, Cutting and [pulping roots.
Baumotte, H. (Jensen), 494, Feb. 10, Painters' easels.
Bayliss, M., & Jones, E., 174, Jan. 16, Nuts and washers.

Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Beck, John, & Blakeborough, R., 227, Jan. 20, Hydrants [and fire cocks.
—— Joseph (*Queen & Co.*), 689, Feb. 25, Prism for [spectroscopic and other purposes.
—— W. H. (*Steinbach & Co.*), 394, Feb. 3, Saddle girths.
Beldam, W. A., Allibon, G., & Manbré, A., 264, Jan. 23, [Steam boilers.
Bell, H., 799, Mar. 4 (*App.* 9.) Nails and tacks.
—— J. M., 565, Feb. 16, Stands for holding books, &c.
Bennett, F. G., 168, Jan. 15, Roller skates.
Benson, M. (*Redheffer*), 388, Feb. 3, Freezing, churn- [ing, &c.
—— M. (*Williams*), 437, Feb. 5, Boots and lasts.
—— M. (*Wicks*), 1139, Mar. 30 (*App.* 7.) Looms.
—— M. (*Wicks*), 1199, Apr. 2 (*App.* 40.) Pattern [chains for looms.
Benwell, R., & Humphreys, G. (Alexander), 196, Jan. 19, [Bale bands.
Berkemeyer, X., 673, Feb. 24, Coats.
Bewsher, J., 339, Jan. 28, Printing.
Bingham, E. W. (Haseltine), 1182, Apr. 1 (*App.* 40.) [Burning bricks, &c.
Binns, L., 335, Jan. 28, Mounting driving bands of [machinery.
Bishop, G. (*Knip*), 403, Feb. 3, Exhibiting pictures.
Blackburn, B., Parkinson, R., & Catlow, S., 720, Feb. 26, [Spinning mules.
Blain, J., 278, Jan. 25, Fire extinguisher.
Blair, R., & Beattie, R., 13, Jan. 1, Sewing-machines.
Blake, L. R., & Gardner, C. F., 206, Jan. 19, Boots [and shoes.
Blakeborough, R., & Beck, J., 227, Jan. 21, Hydrants [and fire-cocks.
Block, G. E., 718, Feb. 26, Artificial leather.
Blot, A. (Vaughan), 37, Jan. 4, Presses.
Bluck, E., 72, Jan. 8, Railway carriages.
Boblique, L., Leplay, H., Box, J., & Aubertin, E., 181, [Jan. 16, Phosphates and phosphorus.
—— L., Leplay, H., Box, J., & Aubertin, E., 214, [Jan. 20, Disinfecting sewage, &c.
Boggett, W., 526, Feb. 12, Ornamental designs, &c.
Bogle, A. (Lake), 395, Feb. 3, Brushing boots and shoes; [polishing, &c.
Bohlken, A. (Jensen), 295, Jan. 26, Washing machine.
—— *A.* (Jensen), 307, Jan. 27, Earth-boring augers.
Boire, E., 1022, Mar. 19 (*App.* 10.) Steam engines.
Bois, A., 45, Jan. 5, Safety guard for tram-cars, &c.
Boivin, G. (Lake), 615, Feb. 19, Cutting leather, &c.
Bomford, E. G. C., 817, Mar. 5 (*App.* 10.) Reaping [machine binders.
Bonnefond, A., 46, Jan. 5, Water meters.
Bonner, J., 11, Jan. 1, Weaving.
Bonneville, H. A. (*Martin*), 2, Jan. 1, Carding fibres.
—— H. A. (*Martin*), 777, Mar. 3, Spindle for [spinning machines.
—— H. A. (*Lesobre*), 1937, May 27 (*App.* 48.) Ovens.
—— H. A. (*Boyle*), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
—— H. A. (*Richards*), 2649, July 26 (*App.* 5.) [Type-setting machines.
Bontemps, P. (Clark), 99, Jan. 11, Hydrostatic motor.
Boone, J. L., & Detrick, E., 2553, July 16 (*App.* 3.) [Sewing machines.
Borchart, H. (Newton), 385, Feb. 2, Bullet patching [machinery.
Boucley, P., 451, Feb. 6, Straps, bands, &c.
Boullenot, A. B. (Edwards), 75, Jan. 8, Safety lamps.
Boulton, J., 311, Jan. 27, Railway signalling.
—— M. P. W., 96, Jan. 11, Hot gas & steam engines.
—— M. P. W., 574, Feb. 17, Fluid engines.
—— M. P. W., 680, Feb. 24, Generating steam.
—— M. P. W., 694, Feb. 25, Condensing steam.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
—— G. T. (*Société Anonyme du Cuivre Français*), [2042, June 3 (*App.* 49.) Protosulphuret of [iron and sulphuretted hydrogen gas.
—— G. T. (*Société Anonyme du Cuivre Français*), [2084, June 5 (*App.* 50.) Kilns or ovens.
—— G. T. (*Kohrig & Pzillas*), 2486, July 10 [(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, har- [ness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181, [Jan. 16, Phosphates and phosphorus.
—— J., Aubertin, E., Boblique, L., & Leplay, H., 214, [Jan. 20, Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro- [magnetic telegraphs.
Boyman, R. B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish- [ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9, [Filling and corking bottles.
Bradford, T., 727, Feb. 27, Cutting, reducing and pul- [verizing bones, &c.
Bradley, C., & Campbell, J., 480, Feb. 9, Combing fibres.
—— G., & Madderson, T., 63, Jan. 7, Crushing [stones, &c.
Bradley, J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Brewer, E. G. (*Müller*), 758, Mar. 2, Railway couplings.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining [powder.
Briebach, J. A., 313, Jan. 27, Indicating position of [rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
—— J., F. W. & W. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
—— W. W., J. & F. W., & Reynolds, F. S., 201, [Jan. 19, Railway signals and points.
Brigg, C. & T. H., & Broughton, T., 757, Mar. 2, Spin- [ning, &c. fibres.
—— T. H. & C., & Broughton, T., 757, Mar. 2, Spin- [ning, &c. fibres.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal [apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Broadfoot, J., 507, Feb. 11, Waterclosets.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F. P. [76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking [apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, H., 475, Feb. 9, Inkstands.
—— H., 476, Feb. 9, Call or signal bell apparatus.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing [electro-type shells.
Broughton, T., & Brigg, C. & T. H., 757, Mar. 2, Spin- [ning, &c. fibres.
Brown, J., 549, Feb. 15, Confectionery.
—— J., 714, Feb. 26, Copper plates for printing, &c.
—— J. F., & Baird, J., 258, Jan. 23, Weaving.
—— J. W., & Allan, G., 525, Feb. 12, Electric telegraphs.
—— M. H., 352, Jan. 30, Fire guards.
—— N., 538, Feb. 13, Weighing-machines.
—— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and [windows.
—— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.

Beattie, R., & Blair, R., 13, Jan. 1, Sewing-machines.
Beck, John, & Blakeborough, R., 227, Jan. 20, Hydrants
[and fire cocks.
—— Joseph (*Queen & Co.*), 689, Feb. 25, Prism for
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———— M. P. W., 680, Feb. 24, Generating steam.
———— M. P. W., 694, Feb. 25, Condensing steam.
Bousfield, G. T. (*Heaton*), 18, Jan. 1, Button fasteners.
———— G. T. (*Société Anonyme du Cuivre Français*),
[2042, June 3 (*App.* 49.) Protosulphuret of
[iron and sulphuretted hydrogen gas.
———— G. T. (*Société Anonyme du Cuivre Français*),
[2084, June 5 (*App.* 50.) Kilns or ovens.
———— G. T. (*Kohrig & Pzillas*), 2486, July 10
[(*App.* 3.) Sugar.
Boucley, P., 451, Feb. 6 (*App.* 3.) Straps, bands, har-
[ness, &c.
Bowers, W. H., & Fyfe, D. A., 101, Jan. 12, Gases.
Bowman, J., 53, Jan. 6, Bottles and stoppers.
Box, J., Aubertin, E., Boblique, L., & Leplay, H., 181,
[Jan. 16, Phosphates and phosphorus.
—— J., Aubertin, E., Boblique, L., & Leplay, H., 214,
[Jan. 20, Disinfecting sewage, &c.
Boyle, R. K. (Bonneville), 2395, July 1 (*App.* 1.) Electro-
[magnetic telegraphs.
Boyman, R B., 67, Jan. 7, Rotary engines, &c.
Bradbury, C. T., & Gartside, J. H., 158, Jan. 15, Finish-
[ing fabrics.
Bradford, J. B., & Ferry, G. H. (Haseltine), 484, Feb. 9,
[Filling and corking bottles.
Bradford, T., 727, Feb. 27, Cutting, reducing and pul-
[verizing bones, &c.
Bradley, C., & Campbell, J., 480, Feb. 9, Combing fibres.
———— G., & Madderson, T., 63, Jan. 7, Crushing
[stones, &c.
Bradley, J., & Wallbank, J., 389, Feb. 3, Spinning.
Bradshaw, J. B., 364, Jan. 30, Splaying hoops for casks.
Bray, M. (Lake), 100, Jan. 12, Rivets; setting same.
Brewer, E. G. (*Müller*), 758, Mar. 2, Railway couplings.
Bricquir, J. F. A. le (Espir), 291, Jan. 26, Mining
[powder.
Briebach, J. A., 313, Jan. 27, Indicating position of
[rudders.
Brierley, F. W., W. W. & J., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
———— J., F. W. & W. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
———— W. W., J. & F. W., & Reynolds, F. S., 201,
[Jan. 19, Railway signals and points.
Brigg, C. & T. H., & Broughton, T., 757, Mar. 2, Spin-
[ning, &c. fibres.
—— T. H. & C., & Broughton, T., 757, Mar. 2, Spin-
[ning, &c. fibres.
Brinsmead, H., 119, Jan. 12, Rotary screens.
Britten, F. J., & Barron, W. S., 118, Jan. 12, Centrifugal
[apparatus.
Broadbent, T., & Westerby, J., 231, Jan. 21, Valves.
Broadfoot, J., 507, Feb. 11, Waterclosets.
Brock, C. T., 247, Jan. 22, Displaying fireworks.
Brockbank, G. H., 315, Jan. 27. Pianofortes.
Brodie, W., Wilson, M., McLay, J. C. S., & Warren, F.P.
[76, Jan. 8, Railway wheels and axles.
Brook, W. P., & Wilson, M., 344, Jan. 29, Cooking
[apparatus.
Brookes, W. (*Hobbs & Orcutt*), 125, Jan. 13, Cartridges.
Brooks, H., 475, Feb. 9, Inkstands.
———— H., 476, Feb. 9, Call or signal bell apparatus.
Brooks, J. S. (Lake), 2168, June 12 (*App.* 51.) Backing
[electro-type shells.
Bronghton, T., & Brigg, C. & T. H., 757, Mar. 2, Spin-
[ning, &c. fibres.
Brown, J., 549, Feb. 15, Confectionery.
———— J., 714, Feb. 26, Copper plates for printing, &c.
———— J. F., & Baird, J., 258, Jan. 23, Weaving.
———— J. W., & Allan, G., 525, Feb. 12, Electric telegraphs.
———— M. H., 352, Jan. 30, Fire guards.
———— N., 538, Feb. 13, Weighing-machines.
———— W. Morgan- (*Colaert*), 90, Jan. 9, Shutters and
[windows.
———— W. Morgan- (*Crompton*), 146, Jan. 14, Looms.

Brown, W. Morgan- (*Donna & Viglino*), 626, Feb. 20, [Motive-power engines.
——— W. Morgan- (*Verdier*), 654, Feb. 23, Treating peat.
——— W. Morgan- (*Doty*), 752, Mar. 2, Lamps.
——— W. Morgan- (*Crompton*), 1967, May 29 (*App.* 49.) [Boiler anti-incrustation battery.
——— W. Morgan- (*Harding & Johnson*), 2119, June 9 [(*App.* 50.) Writing, &c. by means of type.
——— W. Morgan- (*Johnson & Harding*), 2250, June 19 [(*App.* 52.) Tramway rolling stock.
Browne, A. (*Foundries & Forges Co.*) 120, Jan. 12, [Converting iron scraps, &c. into steel.
——— A. (*Fletcher*), 578, Feb. 17, Screw propellers.
Browne, J. (Furrell), 241, Jan. 21, Stand for charts, &c.
Browning, J., 23, Jan. 2, Fastenings for doors, &c.
Brownlow, D. R., & Francis, G. W. (Lake), 340, Jan. 29, [Coating for metals.
Bruce, De V., & Antisell, T. M., 2016, June 2 (*App.* 49.) [Vapor and gas-engines.
Brunner, W. G. (*Schnabel & Henning*), 505, Feb. 11, [Portable cranes.
Brunton, J. D., 702, Feb. 25, Dressing, &c. stone.
Buchanan, T. R. (*Studwell*), 628, Feb. 30, Economising [fuel, &c. in steam-boilers.
Buckley, J. B., & Stock, E., 378, Feb. 2, Stench traps.
Bull, W., 1977, May 31 (*App.* 49.) Kilns for burning [bricks, &c.
Bullivant, W. M., 223, Jan. 20, Floating anchors.
Burdess, A., 329, Jan. 28, Railway breaks.
——— A., 753, Mar. 2, Railway breaks.
Burgh, F. A. de, 106, Jan. 12, Pipes, cigar tubes, &c.
Bürgin, E. (Jensen), 506, Feb. 11, Increasing the adhe- [sion of locomotive wheels on rails.
Burling, E. T., 616, Feb. 19, Pianofortes.
Burlock, F. B. (*Chapman*), 59, Jan. 6, Looms.
Burrell, P., & Valpy, H., 275, Jan. 25, Railway car- [riages; tyres.
Bury, S, 465, Feb. 8, Self-acting temples.
Bustin, R. (Lake), 185, Jan. 18, Hanging wall papers.
Butler, T., 81, Jan. 9, Lace fabrics.
Buxton, T., & Thornley, G., 188, Jan. 18, Casks.
——— T., & Thornley, G., 1518, Apr. 26 (*App.* 44.) [Jointing cask staves.
Byron, G. G. de L. (*Godley*), 550, Feb. 15, Carriage springs.
Bywater, W., 864, Mar. 9 (*App.* 10.) Drawing, spin- [ning, &c. fibres.

C.

Cadogan, Hon. G., 328, Jan. 28, Apparatus for igniting [and holding matches.
Caithness, Earl of, 703, Feb. 25, Cleaning railway rolling [stock, &c.
Calley, S., & Share, H. H., 377, Feb. 2, Raising, &c. boats.
Calverley, J., & MacDonald, J. C., 611, Feb. 19, Printing [presses.
Cameron, A. S., 429, Feb. 4, Steam-engines.
——— P., 604, Feb. 19, Convertible desks and seats.
Campbell, J., & Bradley, C., 480, Feb. 9, Combing fibres.
Cannon, W. G., 294, Jan. 26, Cup and ball joint for gas [pendants, &c.
Carver, J., & Pigott, G., 41, Jan. 4, Twist lace machines.
Casalogna, D. A. (*Janiot*), 591, Feb. 18, Printing presses.
Casson, T., 123, Jan. 13, Hydraulic engines.
Caswell, S., 632, Feb. 20, Railway breaks.
Catchpole, J. L., & Stidolph, G. F. & T. F., 612, Feb. 19, [Cleaning seed.
Catlow, C., & Richmond, T., 32, Jan. 4, Looms.
——— S., Blackburn, B., & Parkinson, R., 720, Feb. 26, [Spinning mules.
Cattlin, A., 849, Mar. 8 (*App.* 10.) Roller skates.
Cave, E., & Tallis, C., 788, Mar. 3, Bottles; closing [bottles, &c.
——— J. O'C., 140, Jan. 14, Aërial navigation.
——— J. O'C., 141, Jan. 14, Governor, steam gauge, [safety valve, &c.
——— J. O'C., 571, Feb. 17, Rest for knives, forks and [spoons.
——— J. O'C., 646, Feb. 22, Torpedoes.
Chadburn, W., 116, Jan. 12, Indicating speed of shafts.
Chambers, A., 734, Mar. 1, Lighting railway carriage [lamps.
——— W. H., 682, Feb. 24, Receptacle for storing [and carrying explosives, &c.
Champney, G. F. (Lake), 842, Mar. 6 (*App.* 10.) Metal dies.
Chameroy, E. A., 417, Feb. 4, Cocks for water, steam, &c.
——— E. A., 828, Mar. 6 (*App.* 6.) Weighing machines.
Chapin, G. B., Toppan, D. L., & Meloon, D. C. & H. H. (Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-planing [machines.
Chapman, C. H. (Burlock), 59, Jan. 6, Looms.
Chapman, L., 1823, May 15 (*App.* 47.) Producing socket [eyes on tools.
Chaquette, E., 416, Feb. 4, Shearing sheep.
Charageat, E., 1046, Mar. 22 (*App.* 48.) Umbrellas, [parasols, &c.
Chase, D. la F., 1450, Apr. 21 (*App.* 43.) Steam governors.
Chatterton, J., 736, Mar. 1, Railway chairs.
Chatwood, S., 155, Jan. 14, Protecting ships, &c. from [fire.
Cheatle, J. H., 230, Jan. 21, Brushes.
Cheshire, J., 764, Mar. 2, Solitaires, sleeve-links, &c.
Chivers, A. & S., 349, Jan. 29, Concentrating sulphuric [acid.
——— S. & A., 349, Jan. 29, Concentrating sulphuric [acid.
Chomel, J. A., 659, Feb. 23, Suspending things in equipoise.
Chubb, G. H., 653, Feb. 22, Connecting railway rails.
Clark, A. (*Dows*), 544, Feb. 15, Treadle apparatus.
——— A. M. (*Portait & Weber*), 28, Jan. 2, Preparing [fibres for spinning.
——— A. M. (*Peck*), 49, Jan. 5, Life-mattresses, pillows, &c.
——— A. M. (*Balestrieri*), 89, Jan. 9, Collecting rays of [light and heat.
——— A. M. (*Bontemps*), 99, Jan. 11, Hydrostatic motor.
——— A. M. (*Reed & Mulligan*), 115, Jan. 12, Knitting [hats, &c.
——— A. M. (*D'Esterno*), 169, Jan. 15, Kite or aërial [apparatus.
——— A. M. (*Johnson*), 199, Jan. 19, Rolling bars for [nut blanks.
——— A. M. (*Eyquem*), 256, Jan. 22, Steel.
——— A. M. (*Rogé, Poret, Baffoy, & Dupré*), 288, [Jan. 25, Preserving woven fabrics.
——— A. M. (*Robinson*), 338, Jan. 28, Feeding and [burning oils in furnaces.
——— A. M. (*Maxwell-Lyte*), 563, Feb. 16, Ammonia.
——— A. M. (*Guérin*), 707, Feb. 26, Enlarging and re- [ducing designs, &c.
——— A. M. (*d'Hurcourt*), 770, Mar. 2, Gas meters.
——— A. M. (*Hartwick & Geyer*), 812, Mar. 4 (*App.* 36.) [Pumps.
——— A. M. (*Porter*), 1042, Mar. 22 (*App.* 7.) Screw [propellers.
——— A. M. (*Taft*), 1153, Mar. 30 (*App.* 40.) Table cutlery [and handles.
——— A. M. (*Edge*), 1615, May 1 (*App.* 45.) Chain swivels.
——— A. M. (*Bates*), 1639, May 3 (*App.* 45.) Locking [screw nuts.
——— A. M. (*Rochow & Matthiessen*), 1810, May 14 (*App.* [46.) Hydraulic engines, &c.
——— A. M. (*Morrell*), 2024, June 2 (*App.* 49.) Floodway [for warehouses.

Clark, A. M. (*Hussey*), 2043, June 3 (*App.* 49.) Electro-
[magnetic engines.
—— A.M.(*Lodge*),2520, July 13 (*App.* 3.), Fulling mills.
—— A. M. (*Powell*), 2997, Aug. 26 (*App.* 9.) Iron ships.
—— A. M. (*Gandolfo & Jarboe*),3030,Aug.28(*App.* 10.)
[Treating bone black ; moulding sugar.
—— A. M. (*Hawley*), 3063, Aug. 31 (*App.* 10.) Wash-
[basin vent clearer.
—— J. L., 198, Jan. 19, Gas regulators, &c.
—— J. L., & Standfield, J., 514, Feb. 11, Floating docks
[and pontoons.
—— W., 80, Jan. 9, Railway breaks.
—— W. (*Malo*), 404, Feb. 3, Ships or vessels.
—— W. (*Legat*), 463, Feb. 6, Sewing straw hats, &c.
—— W. (*Lontin*), 473, Feb. 8, Application of electro-
[dynamic machines.
—— W. (*Rousseau*), 2657, July 27 (*App.* 5.) Railway
[signalling.
—— W. (*Rousseau*), 2740, Aug. 4 (*App.* 6.) Railway
[Signalling.
Clarke, S. & S. B., 685. Feb. 24, Night lights.
—— S. B. & S., 685, Feb. 24, Night lights.
—— T. A. W., Corah, E., & Cooper, J. H., 470, Feb. 8,
[Knitting machines.
Clay, T., & Schulz, J. J., 701, Feb. 25, Tension me-
[chanism for warp beams.
Clayton, A., & Sinclair, J., 629, Feb. 20, Sweeping and
[rolling machines.
—— J., Whittaker, T., & Duxbury, J., 73, Jan. 8,
[Bricks, tiles, &c.
Clements, J. M., 367, Feb. 1, Sewing-machines.
Cleveland Paper Box Machine Co. (Haseltine), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.
Clinker, C., 513, Feb. 11, Printing machines.
Clough, W. R. (Haseltine), 1640, May 3 (*App.* 45.) Cork-
[screws.
Coales, S. L., 334, Jan. 28, Coiling and uncoiling hose
[pipes.
Coddington, R. (*Gally*), 1128, Mar. 27 (*App.* 40.) Telegraphy.
Colaert, H. (Morgan-Brown), 90, Jan. 9, Shutters and
[windows.
Cole, F., 110, Jan. 12, Crushing baryta, cocoa, sugar, &c.
—— F., 698, Feb. 25, Hanging and fastening sashes,
[doors, &c.
—— S., 495, Feb. 10, Compositions for inkstands, picture-
[frames, &c.
Colebrook, C. T., 261, Jan. 23, Raising liquids, &c.
Coleman, C. C., 3072, Sep, 1 (*App.* 10.) Preparing fibres.
Collier, J., & Holding, J., 19, Jan. 2, Domestic coppers
[and other boilers.
—— J., & Marsden, J., 790, Mar. 3, Looms.
Collingwood, E., 79, Jan. 9, Bearings for shafts.
Conn, C. G. (Mills), 782, Mar. 3, Musical instruments.
Connell, A., 302, Jan. 26, Wagons.
Coombe, J. C., 287, Jan. 25, Blacking.
Cooper, A., 728, Feb. 27, Bankers' cheques, &c.
—— J. H., Clarke, T. A. W., & Corah, E., 470, Feb. 8,
[Knitting machines.
Cooper, W. S. (Storer), 693, Feb. 25, Waterclosets.
Constant, J. (Johnson), 301, Jan. 26, Connecting tubes
[to tube plates.
Corah, E., Cooper, J. H., & Clarke, T. A. W., 470, Feb. 8,
[Knitting machines.
Cordillot, H. F. A., & Mather, W., 479, Feb. 9, Steaming
[printed fabrics.
Cornely, E. (Gedge), 306, Jan. 27, Edging machines.
Cornish, H. M. (*Cornish*), 577, Feb. 17, Mattresses, life
[buoys, &c.
Cornish, T. (Cornish), 577, Feb. 17, Mattresses, life
[buoys, &c.
Cory, E., 286, Jan. 25, Motive-power engines, &c.
Cottrill, S., 414, Feb. 4, Railway signals.
Cowper, E. N., 165, Jan. 15, Heating towns.
Cox, J., 723, Feb. 26, Preparing fertilisers.
—— W., 642, Feb. 22, Compressing yarn.
—— W., & Howard, J., 277, Jan. 25, Saddle girth
[tightener.
Crabtree, T., Woodhead, W., & Shaw, B., 740, Mar. 1, Looms.
—— W., & Hanson, W., 3066, Sep. 1 (*App.* 10.) Looms.
Cramp, A. H., 225, Jan. 20, Stretching boots and shoes.
—— A. H., 374, Feb. 1, Marking and cutting textile
[materials.
Crampton, T. R. 789, Mar. 3, Furnaces.
Crandall, C. M. (Lake), 2009, June 1 (*App.* 49.) Toy-
[menageries.
Cranston, W. McI. (*Scott*), 677, Feb. 24, Portable lathes
[for dentists and jewellers.
Crawley, W., 517, Feb. 12, Ships.
Crichley, H., 859, Mar. 8 (*App* 10.) Stoves or fireplaces.
Crist, J. (Edwards), 748, Mar. 1, Furniture castors.
Crocker, S. L., 778, Mar. 3, Smelting copper ores.
Cromby, E. E., 425, Feb. 4, Dry gas meters.
Crompton, G. (Morgan-Brown), 146, Jan. 14, Looms.
—— *G.* (Morgan-Brown), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
Crosby, J. B. (*Kellogg*), 324, Jan. 28, Fur-coated fabrics.
—— J. B. (*Kellogg*), 325, Jan. 28, Head coverings.
Crosland, W., & Salmon, J., 581, Feb. 17, Grinding and
[polishing stones.
Cuivre Français, Société Anonyme du (Bousfield), 2042,
[June 30 (*App.* 49.) Protosulphuret of iron
[and sulphuretted hydrogen gas.
—— (Bousfield), 2084, June 5 (*App.* 50.) Kilns or ovens.
Cunliffe, R., 238, Jan. 21, Railway chairs ; locking nuts.
Currall, J., 730, Feb. 27, Ventilating buildings.
—— J., 858, Mar. 8 (*App.* 10.) Apartments ; bedsteads.
Cutler, W., 601, Feb. 18, Fermenting vats, &c.

D.

Daimler, G. W. (Abel), 71, Jan. 8, Motor engines.
Dann, J. T. (*Gervais*), 1741, May 11 (*App.* 46.) Culinary
[vessels.
Darnell, D. C. W., & Potts, J. C., 272, Jan. 23, Venti-
[lating water-closets, &c.
Dauner, J. L. (Dufrené), 438, Feb. 5, Horse collars.
Davey, H., 323, Jan. 28, Hydraulic pumps.
Davies, J., & Jones, H., 248, Jan. 22, Stoppering bottles.
Daw, M. W., 496, Feb. 10, Scissors.
Deacon, G. F., 50, Jan. 5, Measuring water in pipes.
—— H., 332, Jan. 28, Chlorine.
—— H., 906, Mar. 11 (*App.* 8.) Chlorine.
De Burgh, F. A., 106, Jan. 12, Pipes, cigar tubes, &c.
Defty, H., 760, Mar. 2, Regulating & controlling motion.
D'Esterno, F. C. H. P. (Clark), 169, Jan. 15, Kite or
[aërial apparatus.
D'Hurcourt, E. A. R. (Clark), 770, Mar. 2, Gas meters.
De Liancourt, C. A. Count de G., 390, Feb. 3, Preserving
[life at sea.
Denécé, J., & Wilkin, F. (Lake), 843, Mar. 6 (*App.* 10.)
[Beds or couches.
Dennis, W., 413, Feb. 4, Regulating motion of sewing, &c.
[machines.
Derigny, E., & Tallon, E., 717, Feb. 26, Boot nails, &c.
Detrick, E., & Boone, J. L., 2553, July 16 (*App.* 3.)
[Sewing machines.
Devenport, C., 483, Feb. 9, Crochet hooks.
Deverell, S. R., Deverell, W. T., & Tower, B., 308,
[Jan. 27, Motive-power.
Deverell, W. T., Tower, B., & *Deverell, S. R.*, 308,
[Jan. 27, Motive-power.
Dick, A. (*Giffard*), 55, Jan. 6, Air or gas spring and
[stuffing box.

Gandolfo, J., & Jarboe, J. W. (Clark), 3030, Aug. 28
[(*App.* 10.) Treating bone black ; moulding sugar.

Gandy, M., 52, Jan. 6, Paper material or substitute for
[wood, &c.

——— M., 173, Jan. 16, Railway wheels.

Gardner, C. F., & *Blake, L. R.*, 206, Jan. 19, Boots
[and shoes.

——— E., Hughes, T., Dixon, G., & Maddox, J., 567,
[Feb. 16, Fringes.

——— S., & Rees, E., 320, Jan. 28, Fire bars.

Garfield, W., 664, Feb. 23, Handles for jugs, teapots, &c.

Garland, H. P., 229, Jan. 21, Sewing-machines.

——— H. P., 2248, June 18 (*App.*51.) Sewing-machines.

Garnier, E. M. T., 555, Feb. 15, Spring fastenings.

Gartside, J. H., & Bradbury, C. T., 158, Jan. 15, Finish-
[ing fabrics.

Gatty, F. A., 124, Jan. 13, Printing & dyeing fabrics, &c.

Gaudefroy, C., 433, Feb. 5, Asphaltic fabric.

——— C., 434, Feb. 5, Quilted fabric.

Gauhe, A. (Kottgen), 619, Feb. 20, Coloring matter for
[dyeing, &c.

Gay, P. E., 160, Jan. 15, Excavating and cutting rock, &c.

Gedge, W. E. (*Dufour*), 20, Jan. 2, Agricultural machine.

—— W. E. (*Cornely*), 306, Jan. 27, Edging machines.

—— W. E. (*Gaudefroy*), 433, Feb. 5, Asphaltic fabric.

—— W. E. (*Gaudefroy*), 434, Feb. 5, Quilted fabric.

Gee, W. M., 111, Jan. 12, Vessels and cases for wine, &c.

Geiger, T., & Niemann, G. (Hildebrandt), 316, Jan. 27,
[Tramways.

Gelder, P. van, 732, Feb. 27, Removing smut from
[wheat, &c,.

Gerard, H. (Scott), 38, Jan. 4, Finishing fabrics, &c.

Gervais, A. (Dann), 1741, May 11 (*App.* 46.) Culinary
[vessels.

Gething, W. B., 566, Feb. 16, Filters, &c.

Geyer, H., & Hartwick, G. G. (Clark), 812, Mar. 4
[(*App.* 36.) Pumps.

Geyler, A. E., & Huet, A. J. (Johnson), 681, Feb. 24,
[Treating gases, liquids, &c.

Gibson, J., Howitt, T., & Walker, S., 103, Jan. 12, Stop-
[pering bottles, &c.

Gidlow, T., & Abbott, J., 655, Feb. 23, Steam-boilers
[and furnaces.

Giffard, P. (Dick), 55, Jan. 6, Air or gas spring and
[stuffing box.

Gill, D., 268, Jan. 23, Deodorising sewer gases.

—— *D.*, 2621, July 23 (*App.* 4.) Deodorising sewer
[gases.

Gillman, A. W., & Spencer, S., 234, Jan. 21, Bottling,
[&c. beer.

Gilmore, J., 386, Feb. 2, Turning over leaves of music.

Gilmour, T., 164, Jan. 15, Safety valves.

Girdwood, H. M., 568, Feb. 17, Spinning.

Gledhill, G. & W., 179, Jan. 16, Railway signalling.

——— W. & G., 179, Jan. 16, Railway signalling.

Goddard, G. O., 783, Mar. 3, Roller skates.

Godley, G. (Byron), 550, Feb. 15, Carriage springs.

Goff, R., & Stokes, R., 254, Jan. 22, Busk fastenings, &c.

Gooch, Sir F. S., 775, Mar. 3, Regulating flow of liquids.

Goodwin, W., 559, Feb. 16, Facilitating conveyance, &c.
[of substances.

Goudie, J. T., 712, Feb. 26, Life-saving garment.

Gouverneur, H. G., 452, Feb. 6, Reeds for harmoniums, &c.

——— H. G., 453, Feb. 6, Reeds for harmoniums, &c.

Grafton, S., 735, Mar. 1, Affixing stamps and labels.

Graham, J. C., 202, Jan. 19, Steam-boilers.

Granville, A., & Timmis, I. A., 643, Feb. 22, Treating
[hides, skins, &c.

Grave, A. C. L. (Dorat), 210, Jan. 20, Gas burners.

Gray, E. (Johnson), 974, Mar. 16 (*App.* 38.) Trans-
[mitting musical vibrations, &c.

Green, J., 44, Jan. 5, Fuel economiser for fire-grates.

—— W., 129, Jan. 13, Soaps.

Greenwood, F. A., 467, Feb. 8, Spinning.

Greig, D., & Eyth, M., 663, Feb. 23, Engines.

Griffiths, E., & Absalom, W., 151, Jan. 14, Steering ships.

Grosclaude, L. A. (Weill & Harburg), 528, Feb. 12,
[Musical boxes, &c.

Grover, J. W., 772, Mar. 3, Spring washers.

Gudgeon, W., 582, Feb. 17, Preparing fibres.

Guérin, V. (Clark), 707, Feb. 26, Enlarging and reducing
[designs, &c.

Guitard, L. J., & Rolin, I. C. C. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.

H.

Haag, J. (Scott), 236, Jan. 21, Heating railway carriages.

Haagen, C. van (Johnson), 47, Jan. 5, Sharpening drills.

Haddan, J. C., & Smith, H., 412, Feb. 4, Carving forks.

——— J. C., & Smith, H., 755, Mar. 2, Joining ends
[of rails.

Haggas, W., 285, Jan. 25, Looms.

Hahn, I. (Imray), 2903, Aug. 18 (*App.* 8.) Rolling mills.

Hainsworth, M., 239, Jan. 21, Extinguishing fires.

Haley, H., & Mills, E. C., 265, Jan. 23, Gas engines.

Hall, D. & J., 428, Feb. 4, Temples for looms.

—— James, 346, Jan. 29, Lime and cement kilns.

—— James & D., 428, Feb. 4, Temples for looms.

—— John, 731, Feb. 27, Discharging ores, &c.

—— W. J., Marshall, F. A., & Skinner, C. W., 530,
[Feb. 13, Feed heaters for boilers.

Hallett, B., & Rood, G. A., 630, Feb. 20, Bicycles.

——— G., & Lester, H. E., 36, Jan. 4, Lowering boats.

Halley, G., 444, Feb. 5, Nut blanks.

Hallsworth, S., & Bailes, R., 573, Feb. 17, Treating sewage.

Hamburg-American Sewing-Machine Co. (Jensen), 26,
[Jan. 2, Printing metals.

Handyside, H., 376, Feb. 2, Chains or cables.

Hanson, W., & Crabtree, W., 3066, Sep. 1 (*App.* 10.) Looms.

Harburg, H., Weill, L., (*Grosclaude*), 528, Feb. 12,
[Musical boxes, &c.

Harding, G. P., & Johnson, J. R. (Morgan-Brown), 2119,
[June 9 (*App.* 50.) Writing, &c. by means of type.

——— *G. P., & Johnson, J. R.* (Morgan-Brown), 2250,
[June 19 (*App.* 52) Tramway rolling stock.

Hardy, T. E. (*Minns*), 687, Feb. 25, Artificial leather.

Hargreaves, H. E., 353, Jan. 3, Indicating speed of ships.

——— J., 147, Jan. 14, Sulphates.

Harper, R. R., 336, Jan. 28, Electric telegraph apparatus.

Harrington, J., & Watkins, D., 759, Mar. 2, Roller skates.

Harris, C., & Fyfe, A. L., 405, Feb. 3, Dress improvers.

Harrison, C., 363, Jan. 30, Umbrella runners.

Harrison, G. W. (*Lake*), 2774, Aug. 5 (*App.* 6.) Harvesters.

——— S. L., 461, Feb. 6, Axles for railway cars.

——— W. H., 749, Mar. 1, Boxes for tooth powders, &c.

Hartwick, G. G., & Geyer, H. (Clark), 812, Mar. 4 (*App.*
[36.) Pumps.

Harvey, J., 222, Jan. 20, Two-wheeled carriages.

Haseltine, G. (*McVicar & McVicar*), 27, Jan. 2, Teaching.

——— G. (*Smythe*), 422, Feb. 4, Balanced slide-valves.

——— G. (*Bradford & Ferry*), 484, Feb. 9, Filling
[and corking bottles.

——— G. (*Winchester & Phelps*), 485, Feb. 9, Rock
[drills.

——— G. (*Keene & Sawyer*), 700, Feb. 25, Surfaces
[for steps, &c.

——— G. (*Cleveland Paper Box Machine Co.*), 1008,
[Mar. 18 (*App.* 38.) Paper boxes.

——— G. (*Toppan, Meloon, Chapin & Meloon*), 1009,
[Mar. 18 (*App.* 38.) Wood-planing machines.

——— G. (*Bingham*), 1182, Apr. 1 (*App.* 40.) Burning
[bricks, &c.

Johnson, J. C., 209, Jan. 20, Forming tube skelps.
———— J. H. (*Van Haagen*), 47, Jan. 5, Sharpening [drills.
———— J. H. (*Lowerre & Tucker*), 85, Jan. 9, Goffer- [ing, &c.
———— J. H. (*Bañolas*), 138, Jan. 13, Extinguishing [fires.
———— J. H. (*Constant*), 301, Jan. 26, Connecting [tubes to tube plates.
———— J. H. (*Adamson*), 381, Feb. 2, Starch, &c.
———— J. H. (*Marot*), 408, Feb. 3, Saccharine solu- [tions.
———— J. H. (*Lamarre*), 409, Feb. 3, Signalling and [illuminating.
———— J. H. (*Huyttens*), 445, Feb. 5, Bread.
———— J. H. (*Oexle*), 561, Feb. 16, Grinding corn, &c.
———— J. H. (*Jeantaud*), 651, Feb. 22, Wheels.
———— J. H. (*Huet & Geyler*), 681, Feb. 24, Treating [gases, liquids, &c,
———— J. H. (*Société Financière de Paris*), 704, Feb. 25 [Treating alunite.
———— J. H. (*Tastz*) 742, Mar. 1, Medical capsules.
———— J. H. (*Nye*), 765, Mar. 2, Snap-hooks.
———— J. H. (*Nye*), 766, Mar. 2, Snap-hooks.
———— J. H. (*Nye*), 767, Mar. 2, Snap-hooks.
———— J. H. (*Gray*), 974, Mar. 16 (*App.* 38.) Trans- [mitting musical vibrations, &c.
———— J. H. (*Moehring*), 1882, May 22 (*App.* 48.) [Lamps and lamp burners.
Johnson, J. R., & Harding, G. P. (Morgan-Brown), 2119, [June 9 (*App.* 50.) Writing, &c. by means of type.
———— *J. R., & Harding, G. P.* (Morgan-Brown) [2250, June 19 (*App.* 52.) Tramway rolling stock.
Johnson, R., 400, Feb. 3, Obtaining motive-power.
———— S., & Allan, W., 191, Jan. 18, Heating feed [water; condensing steam.
———— S. H., 156, Jan. 14, Cocks or valves.
———— S. H., 810, Mar. 4 (*App.* 10.) Glucose.
Joliot, J. P. S., 204, Jan. 19, Railway breaks.
Jolley, W., 172, Jan. 16, Railway signalling.
Jones, E., & Bayliss, M., 174, Jan. 16, Nuts and washers.
—— E. A. & J. A., 956, Mar. 15 (*App.* 6.) Rotary [puddling furnaces.
—— H., & Davies, J., 248, Jan. 22, Stoppering bottles.
—— H. L., 492, Feb. 10, Disinfectants and deodorizers.
—— J. A. & E. A., 956, Mar. 15 (*App.* 6.) Rotary [puddling furnaces.
—— J. W., 595, Feb. 18, Clips or fastenings for boots, [&c.
—— R. A., & Perry, J. J., 12, Jan. 1, Lighting cigars, &c.
—— T., 482, Feb. 9, Preserving and rendering wood [uninflammable.
—— T. O., 688, Feb. 25, Ferrules.
—— W. P., 510, Feb. 11, Fire-arms.
Jucker, R., 132, Jan. 13, Cleaning knives and forks.
Justice, P. S. (*Shaw*), 793, Mar. 3, Valves.

K.

Kaselowsky, E. (Pieper), 535, Feb. 13, Steam-boilers.
Kaulbach, E., 542, Feb. 15, Rotatory engine.
Kay, J. A. (Wise), 1461, Apr. 21 (*App.* 43.) Knot-tying [apparatus.
Keene, G. A., & Sawyer, F. A. (Haseltine), 700, Feb. 25, [Surfaces for steps, &c.
Keirby, J. E., 737, Mar. 1, Packing for pistons, &c.
Kelen, L. V., 721, Feb. 26, Gas stove.
Kellogg, H. (Crosby), 324, Jan. 28, Fur coated fabrics.
———— *H.* (Crosby), 325, Jan. 28, Head coverings.
Kelly, S. J. J., 521, Feb. 12, Producing letters, &c. upon [glass.
Kendall, W. J., & Robinson, G. A., 588, Feb. 18, Castors.
Kendrick, T., 31, Jan. 4, Coffin furniture.
Kennard, H. J., 846, Mar. 8 (*App.* 9.) Stoves and flue pipes.
Kennedy, J., & Wigg, C., 314, Jan. 27, Furnaces.
Kennedy, W., & Acheson, G., 40, Jan. 4, Spinning.
Kenyon, J. & J. H., 738, Mar. 1, Carding fibres.
———— J. H. & J., 738, Mar. 1, Carding fibres.
Kerby, J., 274, Jan. 23, Boots.
Kessler, J. L., & Faure, M. J. F. R. (Sauvée), 2897, [Aug. 17 (*App.* 8.) Sulphuric acid.
Kidd, J., 531, Feb. 13, Gas.
—— J., & *Arnold, L.*, 66, Jan. 7, Gas.
King, J. T. (*Westinghouse*), 569, Feb. 17, Motive-power [engines.
—— N., 2953, Aug. 23 (*App.* 9.) Fire-arms.
Kirby, W., 503, Feb. 11, Coffins.
Kitson, R. (Haseltine), 2433, July 5 (*App.* 2.) Opening [cotton.
Klinkerfues, W. (Jensen), 167, Jan. 15, Hygrometers.
Knap, C., Taunton, R. H., & Hayward, G., 208, Jan. 19, [Wrought iron tubes.
Knaust, W. (Wirth), 439, Feb. 5, Valves.
———— *W.* (Wirth), 678, Feb. 24, Stop valves.
Knelles, C. H. (Lake), 486, Feb. 9, Imitation leather, [damask, &c.
Knip, J. F. (Bishop), 403, Feb. 3, Exhibiting pictures.
Kohrig, R., & Pzillas, R. (Bousfield), 2486, July 10 [(*App.* 3.) Sugar.
Kosloff, S. A., 441, Feb. 5, Electric light.
Kosminski, M., 522, Feb. 12, Articles of dress for ladies.
Kottgen, A. (*Gauhe*), 619, Feb. 20, Coloring matter for [dyeing, &c.
Kritch, W. C., 464, Feb. 6, Cutting paper.
Kuenemann, J. B. (*Magner & Kunemann*), 194, Jan. 19, [Treating and dyeing vegetable textiles.
Kuhlmann, H. (Wirth), 679, Feb. 24, Pegging boots.
Kunemann, E., & Magner, P. (Kuenemann), 194, Jan. 19. [Treating and dyeing vegetable textiles.

L.

Ladd, J. H. (*Whipple*), 621, Feb. 20, Healds for looms.
Lake, W. R. (*Silcox*), 5, Jan. 1, Kindling fires.
—— W. R. (*Fitz-Patrick*), 42, Jan. 4, Drawers.
—— W. R. (*Russell*), 48, Jan. 5, Horse-shoes.
—— W. R. (*Bray*), 100, Jan. 12, Rivets; setting same.
—— W. R. (*Whittemore*), 163, Jan. 15, Spikes.
—— W. R. (*Bustin*), 185, Jan. 18, Hanging wall papers.
—— W. R. (*McClintock*), 207, Jan. 19, Preserving [substances.
—— W. R. (*Imlay*), 253, Jan. 22, Preventing fraud by [tram-car conductors.
—— W. R. (*Farris*), 310, Jan. 27, Water circulating [bars.
—— W. R. (*Brownlow & Francis*), 340, Jan. 29, Coat- [ing for metals.
—— W. R. (*Bogle*), 395, Brushing boots and shoes; [polishing, &c.
—— W. R. (*Osborne*), 417, Feb. 8, Harvesting machines.
—— W. R. (*Larkin*), 472, Feb. 8, Furnace grates.
—— W. R. (*Knelles*), 486, Feb. 9, Imitation leather, [damask, &c.
—— W. R. (*Lazar*), 536, Feb. 13, Railways.
—— W. R. (*Boivin*), 615, Feb. 19, Cutting leather, &c.
—— W. R. (*Thomas*), 671, Feb. 23, Bustles and pads [for ladies' dress.
—— W. R. (*Shepard & Seaman*), 761, Mar. 2, Regu- [lating flow of gas, &c.

Lake, W. R. (*Champney*), 842, Mar. 6 (*App.* 10.) Metal
[dies.
—— W. R. (*Deneéf & Wilkin*), 843, Mar. 6 (*App.* 10.)
[Beds or couches.
—— W. R. (*Martin*), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
—— W. R. (*Crandall*), 2009, June 1 (*App.* 49.) Toy-
[menageries.
—— W. R. (*Rogers*), 2045, June 1 (*App.* 49.) Smelting
[ores ; making iron ; furnaces.
—— W. R. (*McClintock*), 2080, June 5 (*App.* 50.)
[Compositions for paving, &c.
—— W. R. (*James*), 2089, June 7 (*App.* 50.) Leather
[pulp.
—— W. R. (*Brooks*), 2168, June 12 (*App.* 51.) Backing
[electrotype shells.
—— W. R. (*Wilson*), 2234, June 17 (*App.* 51.) Steam-
[boiler valves.
—— W. R. (*Bannister & Milligan*), 2245, June 18,
[(*App.* 51.) Device for advertising.
—— W. R. (*Harrison*), 2774, Aug. 5 (*App.* 6.) Har-
[vesters.
—— W. R. (*Shedd & Jenks*), 3070, Sep. 1 (*App.* 10.)
[Liquid meters, pumps, motor engines.
Lamarre, E. A. A. (Johnson), 409, Feb. 3, Signalling
[and illuminating.
Lambert, C., 360, Jan. 30, Rain water filters.
Lancaster, W., 250, Jan. 22, Sizing and dressing ma-
[chines, &c.
Land, E., 706, Feb. 26, Propelling boats.
Larkin, J. B. (Lake), 472, Feb. 8, Furnace grates.
Laslett, T. N., 523, Feb. 12, Measuring heights and
[distances of objects.
Law, J. H., Redfern, T., & Smith, P., 431, Feb. 5, Paper
[making.
Lawrance, E., 796, Feb. 30 (*App.* 8.) Curing corns.
Lawrence, J. E., & Porter, E. V., 791, Mar. 3, Centri-
[fugal pumps.
Lawson, G., 780, Mar. 3, Excavating.
—— G., 802, Mar. 4 (*App.* 10.) Railway rails.
Laycock, G., 805, Mar. 4 (*App.* 10.) Controlling speed
[of horses.
—— P., 572, Feb. 17, Stiffening & staining fabrics.
—— P., 779, Mar. 3, Cutting flocks.
—— W. S., 478, Feb. 9, Electric breaks.
Lazar, A. (Lake), 536, Feb. 13, Railways.
Leach, R., & Webb, J., 257, Jan. 22, Embroidering.
Leachman, W. B., & Nussey, G. H., 139, Jan. 14,
[Punching and rivetting machines, &c.
Le Bricquir, J. F. A. (Espir), 291, Jan. 26, Mining
[powder.
Lee J., 131, Jan. 13; Fire-arms.
—— J. W., 481, Feb. 9, Rotary pumps.
Lees, T., & Pidgeon, J., 260, Jan. 23, Hats.
Legat, D. M. (Clark), 463, Feb. 6, Sewing straw hats, &c.
Leiter, J. (Wirth), 296, Jan. 26, Electric apparatus.
Leplay, H., Box, J., Aubertin, E., & Boblique, L., 181,
[Jan. 16, Phosphates and phosphorus.
—— H., Box, J., Aubertin, E., & Boblique, L., 214,
[Jan. 20, Disinfecting sewage, &c.
Lesobre, C. (Bonneville), 1937, May 27 (*App.* 48.)
[Ovens.
Lester, H. E., & Hallett, G., 36, Jan. 4, Lowering boats.
Lévèque, A. J. J. (Dufrene), 195, Jan. 19, Railway
[sleepers.
Levet, C. (Wise), 3, Jan. 1, Boring rock, &c.
Levey, C., & Myles, W., 670, Feb. 23, Nuts & washers.
Lewis, G. H., 137, Jan. 13, Cigars.
—— R. T., 237, Jan. 21, Looking glasses and mirrors.
Liancourt, C. A. Count de G. de, 890, Feb. 3, Preserving
[life at sea.
Lillie, J., 606, Feb. 19, Kitchen ranges, &c.
Lind, J., 457, Feb. 6, Securing ends of bale bands.
Lindley, L., 683, Feb. 24, Making fabric on lace machinery.
Lipman, H., 781, Mar. 3, Protecting tea chests.
Livesey, J., 599, Feb. 18, Railways and tramways.
Lloyd, C. M., 672, Feb. 24, Window frames ; hanging
[sashes.
—— J., & Scully, J., 226, Jan. 20, Drying wall
[papers, &c.
Lodge, W. B. (Clark), 2520, July 13 (*App.* 3.) Fulling mills.
Loebl, S., 614, Feb. 19, Heating and cooking apparatus.
Loewenberg, H., 420, Feb. 4, Imitation braids, leather, &c.
Lœwenstein, D., & Ward, S., 78, Jan. 8, Doubling, &c.,
[threads ; stop motion.
Lofts, E., 2153, June 12 (*App.* 9.) Checking monies.
Lomax, G. H., 1642, May 3 (*App.* 45.) Lamps.
—— J., & Atherton, W., 699, Feb. 25, Looms.
Longsdon, D., & Toppin, P., 176, Jan. 16, Horse-shoes.
Lontin, D. F. (Clark), 473, Feb. 8, Application of electro-
[dynamic machines.
Low, D. G. (Ramsay), 1956, May 28 (*App.* 48.) Sail
[hank or shackle.
Lowe, R. E. (Poole), 29, Jan. 4, Cutting blind slats.
Lowerre, A. H., & Tucker, T. M. (Johnson), 85, Jan. 9,
[Goffering, &c.
Luckenbach, F. A., 243, Jan. 21, Casting and annealing
[slag.
Lupton, A., 148, Jan. 14, Self-lubricating wheels and
[axles, &c.
Lyman, D. T. (Haseltine), 1781, May 13 (*App.* 46.)
[Thread-spools, pail-handles, &c.
Lyte, F. Maxwell (Clark), 563, Feb. 16, Ammonia.
Lyttle, W. A , 105, Jan. 12, Iron, steel, &c.
—— W. A., 455, Feb. 6, Making alkali, &c.
—— W. A., 627, Feb. 20, Alkali.
—— W. A., 656, Feb. 23, Toilet soap.

M.

McClintock, J. R. (Lake), 207, Jan. 19, Preserving
[substances.
—— *J. R.* (Lake), 2080, June 5 (*App.* 50.) Com-
[positions for paving, &c.
MacDonald, J. C., & Calverley, J., 611, Feb. 19, Print-
[ing presses.
McEvoy, C. A., 270, Jan. 23, Extinguishing fire.
Mackay, G., 91, Jan. 11, Purifying liquids ; recovering, &c.
[waste products.
—— M., 200, Jan. 19, Compounds for dissolving
[resins, &c.
Mackenzie, J. F., 93, Jan. 11, Hot-air apparatus.
Mackinnon, D., 2497, July 12 (*App.* 3.) Writing
[instruments.
Maclaren, J., 415, Feb. 4, Watch protector.
McLay, J. C. S., Warren, F. P., Brodie, W., & Wilson, M.,
[76, Jan. 8, Railway wheels and axles.
Mac Lellan (*Sheward*), 1179, Apr. 1 (*App.* 10.) Screw
[jacks.
McLeod, F. H., 903, Mar. 11 (*App.* 9.) Sheep dip or
[composition.
McPhail, W., 220, Jan. 20, Compositors' case frames.
McVicar, D. H. & M. (Haseltine), 27, Jan. 2, Teaching.
—— *M. & D. H.* (Haseltine), 27, Jan. 2, Teaching.
Madderson, T., & Bradley, G., 63, Jan. 7, Crushing
[stones, &c.
Maddox, J., Gardner, E., Hughes, T., & Dixon, G., 567,
[Feb. 16, Fringes.
Maes, L. (*Fouillon*), 831, Jan. 28, Gloves.
Magner, P., & Kunemann, E. (Kuenemann), 194, Jan. 19,
[Treating and dyeing vegetable textiles.
Main, R., 127, Jan. 18, Hot blast.
Mallet, R., 144, Jan. 14, Producing plates with inscrip-
[tions, &c.

Malo, G. (Clark), 404, Feb. 3, Ships or vessels.
Manbré, A., 579, Feb. 17, Treating vegetable substances;
[making spirits, &c.
——— A., Beldam, W. A., & Allibon, G., 264, Jan. 23,
[Steam-boilers.
Mann, W., & Owens, S., 862, Mar. 9 (*App.* 8.) Valves.
Manning, R. H., 263, Jan. 23, Plane irons.
Maquet, H. J., 281, Jan. 25, Railway carriage guard
[railings.
Marais, E. L., & Durand, F., 1534, Apr. 27 (*App.* 44.)
[Moulding bricks, &c.
Marchant, R. M., 304, Jan. 27, Furnaces.
Marillier, R. A., 497, Feb. 10, Raising, tipping and
[lowering trucks.
Marler, E. T. (*Reckendorfer*), 215, Jan. 20, Pencil cases.
Marot, L. (Johnson), 408, Feb. 3, Saccharine solutions.
Marsden, B., 177, Jan. 16, Nuts for screw bolts.
——— J., & Collier, J., 790, Mar. 3, Looms.
Marshall, F. A., Skinner, C. W., & Hall, W. J., 530,
[Feb. 13, Feed heaters for boilers.
——— J., 162, Jan. 15, Thrashing machines.
Marshall, N., 583, Feb. 18, Fancy hosiery.
Martin, C. (Bonneville), 2, Jan. 1, Carding fibres.
——— *C.* (Bonneville), 777, Mar. 3, Spindle for spin-
[ning machines.
Martin, J. C., 64, Jan. 7, Emery wheels, &c.
Martin, M. (Lake), 949, Mar. 13 (*App.* 38.) Flour-
[dressing machines.
Martin, T., 468, Feb. 8, Lamps.
Mason, W., 245, Jan. 22, Preventing incrustation in boilers.
Masui, T. (Wise), 792, Mar. 3, Electric railway breaks.
Mather, J., 211, Jan. 20, Air-gas.
——— J., & Spier, R., 622, Feb. 20, Gas.
——— W., & Cordillot, H. F. A., 479, Feb. 9, Steaming
[printed fabrics.
Matheson, J. P., & Tavernier, L. F., 361, Jan. 30, Felted
[fabrics.
Mathian, V., & Solet, F. (Abel), 1545, Apr. 27 (*App.*
[44.) Heating air, &c.
Matthews, M. J. (Hunt), 6, Jan. 1, Musical instruments.
Matthiessen, F. O., & Rochow, F. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Maxwell-Lyte, F. (Clark), 563, Feb. 16, Ammonia.
Mayer, H. C., 259, Jan. 23, Spirometers.
Maynard, J. A. (Vaughan), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls.
Maynard, R., 879, Mar. 10 (*App.* 8.) Chaff-cutters.
Meloon, D. C. & H. H., Toppan, D. L., & Chapin, G. B.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
——— *H. H. & D. C., Toppan, D. L., & Chapin, G. B.*
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Melton, F., 620, Feb. 20, Nail and other brushes.
Melvill, R. A., 554, Feb. 15, Fastening windows, &c.
Mesdach, L., 776, Mar. 3, Accumulating hydrostatic
[pressure.
Metcalf, H. (Newton), 771, Mar. 2, Holding, &c. cartridges.
Meunier, C. (Abel), 1433, Apr. 20 (*App.* 43.) Flapped
[axles.
Middleton, W., & Hayward, P., 493, Feb. 10, Melting,
[&c. metals.
Milburn, R., & Jackson, H., 518, Feb. 12, Treating salts,
[ores, &c.
Millbourn, C., 7, Jan. 1, Railway signalling.
Miller, W. R., 24, Jan. 2, Pianos.
Milligan, S., & Bannister, R. D. (Lake), 2245, June 8
[(*App.* 51.) Device for advertising.
Mills, B. J. B. (*Siprell*), 246, Jan. 22, Rock reamers, &c.
——— B. J. B. (*Conn*), 782, Mar. 3, Musical instruments.
——— E. C., & Haley, H., 265, Jan. 23, Gas engines.
Milner, E., 54, Jan. 6, Furnaces.
Minns, H. R. (Hardy), 687, Feb. 25, Artificial leather.
Mitchell, J. & W., 410, Feb. 3, Umbrellas and parasols.
——— W. & J., 410, Feb. 3, Umbrellas and parasols.
——— W. H., 318, Jan. 27, Cut-off slide valves.
Moehring, H. G. (Johnson), 1882, May 22 (*App.* 48.)
[Lamps and lamp burners.
Moelchaerck, G. R., & Morgan, O. V., 625, Feb. 20,
[Filtering water.
Monk, W., & Rawsthorne, T., 435, Feb. 5, Carding en-
[gine rollers.
Moreau, E., 228, Jan. 21, Sewing-machines.
Morgan, O. V., & Moelchaerek, G. R., 625, Feb. 20,
[Filtering water.
Moore, A. & A. C., 354, Jan. 30, Sheet metal roofing.
——— A. C. & A., 354, Jan. 30, Sheet metal roofing.
Morgan-Brown, W. (*Colaert*), 90, Jan. 9, Shutters and
[windows.
——— W. (*Crompton*), 146, Jan. 14, Looms.
——— W. (*Viglino & Donna*), 626, Feb. 20,
[Motive-power engines.
——— W. (*Verdier*), 654, Feb. 23, Treating peat.
——— W. (*Viglino & Donna*), 729, Feb. 27,
[Railway axles.
——— W. (*Doty*), 952, Mar. 2, Lamps.
——— W. (*Crompton*), 1967, May 29 (*App.* 49.)
[Boiler anti-incrustation battery.
——— W. (*Harding & Johnson*), 2119, June 9
[(*App.* 50.) Writing, &c. by means of
[type.
——— W. (*Johnson & Harding*), 2250, June 19
[(*App.* 52) Tramway rolling stock.
Morrell, J. H. (Clark), 2024, June 2 (*App.* 49.) Flood-
[way for warehouses.
Morris, J. M., & Simmons, J., 289, Jan. 25, Purifying
[gas for aërial purposes.
Morton, W. W., 880, Mar. 10 (*App.* 10.) Firearms.
Mosman, D. F., 751, Mar. 1, Generating & utilizing steam.
Mountford, E. C. & W., 292, Jan. 26, Games.
——— W. & E. C., 292, Jan. 26, Games.
Muirhead, A., & Taylor, H. A., 684, Feb. 24, Telegraphs.
Mulholland, J. R. T., & Porter, W. M., 647, Feb. 23,
[Carding engines.
Müller, R. (Brewer), 758, Mar. 2, Railway couplings.
Mullholland, H. (Rogers), 161, Jan. 15, Cut nails.
Mulligan, B. T., & Reed, A. (Clark), 115, Jan. 12, Knit-
[ting hats, &c.
Munn, A., Rennie, J., & Sutherland, J., 419, Feb. 4,
[Sinking cylinders for foundations.
Murdoch, H. H. (*Follett*), 1357, Apr. 14 (*App.* 42.)
[Sewing-machines.
Murray, A. W., 382, Feb. 2, Lamps.
Myers, H., & Holland, W., 34, Jan. 4, Umbrellas and
[parasols.
Myers, M., 570, Feb. 17, Pen boxes, &c.
Myles, W., & *Levey, C.*, 670, Feb. 23, Nuts and washers.

N.

Nairn, M. B., 35, Jan. 4, Floor cloths.
Napier, W. D., 633, Feb. 20, Tooth and flesh brushes or
[rubbers
Nardi, F. D., 216, Jan. 20, Boots and shoes.
Neil, C., 402, Feb. 3, Stocks and dies.
Nelson, W., 145, Jan. 14, Scarf clip or adjuster.
Neuhaus, M., 668, Feb. 23, Gas.
Neuss, H. F. (Wirth), 705, Feb. 25, Needle machines.
Newbold, E., 267, Jan. 23, Furnace bars.
Newsome, C. H., & Fenton, J. & W., 14, Jan. 1, Carding,
[&c. fibres.
Newton, A. V. (*Borchart*) 385, Feb. 2, Bullet patching
[machinery.

Newton, A. V. (*Felt*), 600, Feb. 18, Ordnance.
——— A. V. (*Metcalf*), 771, Mar. 2, Holding, &c. [cartridges.
——— E., 624, Feb. 20, Frame saws.
——— H. E. (*Nobel*), 153, Jan. 14, Burners for lighting.
Nicholson, E., & Topp, N. & A., 283, Jan. 25, Carding [engines.
Niemann, G., & Geiger, T. (Hildebrandt), 316, Jan. 27, [Tramways.
Noad, J, 592, Feb. 18, Steel.
Nobel, A. (Newton), 153, Jan. 14, Burners for lighting.
North, T. (*Tomlinson*), 130, Jan. 13, Axle-boxes.
Notton, S., 743, Mar. 1, Cutting or carving wood, &c.
Nussey, G. H., & Leachman, W. R., 139, Jan. 14, Punch- [ing and rivetting machines, &c.
Nye, C. (Johnson), 765, Mar. 2, Snap-hooks.
—— *C.* (Johnson), 766, Mar. 2, Snap-hooks.
—— *C.* (Johnson), 767, Mar. 2, Snap-hooks.

O.

Oexle, O. (Johnson), 561, Feb. 16, Grinding corn, &c.
Olpherts, R., 560, Feb. 16, Screw presses, &c.
Orcutt, J., & Hobbs, A. C. (Brookes), 125, Jan. 13, [Cartridges.
Ormson, H., 317, Jan. 27, Hot-water apparatus.
Osborne, D. M. (Lake), 471, Feb. 8, Harvesting ma- [chines.
Osmond, J., 547, Feb. 15, Dog-carts, &c.
Outerson, A. & J., 558, Feb. 16, Filters.
——— J. & A., 558, Feb. 16, Filters.
Owens, S., & Mann, W., 862, Mar. 9 (*App.* 8.) Valves.

P.

Packer, D. F. (Richards), 739, Mar. 1, Artificial fuel.
Page, H., & Turner, C., 778, Mar. 3, Removing hair [from hides, &c.
Paling, S. (Paling), 3055, Aug. 31 (*App.* 10.) Window [blind rollers.
Paling, T. H. (*Paling*), 3055, Aug. 31 (*App.* 10.) Window [blind rollers.
Palmer, H. T., 345, Jan. 29, Mules and mule doublers.
Paper Box Machine Co., The Cleveland (Haseltine), [1008, Mar. 18 (*App.* 38.) Paper boxes.
Pare, H. B., 800, Mar. 4 (*App.* 10.) Feeding and other [bottles.
Parker, C. (Hughes), 61, Jan. 6, Claw hammers.
Parker, G., 556, Feb. 16, Riddling and loading coal, &c.
Parkes, A., 841, Mar. 6 (*App.* 10.) Furnaces.
Parkinson, R., Catlow, S., & Blackburn, B., 720, Feb. 26, [Spinning mules.
Patrick, R., 2499, July 12 (*App.* 3.) Rotary pumps and [engines.
Payton, W., & Holmes, J. E., 343, Jan. 29, Sawing [machinery.
Peacock, J. C., & Rudkin, T., 590, Feb. 18, Cooking, &c.
Pearson, D. R., 516, Feb. 12, Backs and handles for [brushes.
Peck, J. F. (Clark), 49, Jan. 5, Life-mattresses, pillows, &c.
Pendleton, H. G., 337, Jan. 28, Fastenings for braces, [purses, &c.
Perkins, L., 224, Jan. 20, Steam-engines, &c.
——— S., & Smellie, W., 218, Jan. 20, Furnaces.
——— W., 533, Feb. 13, Communicating in trains.
Perry, J. J., 233, Jan. 21, Wheel skates.
——— J. J., & Jones, R. A., 12, Jan. 1, Lighting cigars, &c.
——— R. G., 152, Jan. 14, Drying peat, &c.
Petit, H. J., 501. Feb. 10, Sewing-machines.
Pflaum, J. F. A., & Walker, B., 719, Feb. 26, Hydraulic [machinery.
Phelps, H. W., & Winchester, E. S. (Haseltine), 485, [Feb. 9, Rock drills.
Pictet, R. P., 2727, Aug. 3 (*App.* 6.) Sulphurous acid; [producing cold.
Pidgeon, J., & Lees, T., 260, Jan. 23, Hats.
Pieper, C. (*Kaselowsky*), 535, Feb. 13, Steam-boilers.
Pieri, P., & Smith, W., 342, Jan. 29, Bidon and drink- [ing bottle.
Pigott, G., & Carver, J., 41, Jan. 4, Twist lace machines.
Pilbrow, J., 835, Mar. 6 (*App.* 10.) Skates.
Pilté, A., 2072, June 5 (*App.* 50.) Horse-shoes.
Pinchbeck, J., 669, Feb. 23, Fire lighters.
Pitchford, W. F., 726, Feb. 27, Dissolving gums.
Pollard, J., & Wright, M., 133, Jan. 13, Driving spindles.
Poole, W. (*Lowe*), 29, Jan. 4, Cutting blind slats.
Pope, R. P., 159, Jan. 15, Walls, floors, roofs, &c.
—— R. P., 448, Feb. 6, Trapping waterclosets, &c.
Poret, E., Baffoy, P. H., Dupré, P. S. E., & Rogé, H. N. [(Clark), 288, Jan. 25, Preserving woven fabrics.
Portait, E. P. E., & Weber, C. P. (Clark), 28, Jan. 2, [Preparing fibres for spinning.
Porter, E. B. (Clark), 1042, Mar. 22 (*App.* 7.) Screw [propellers.
Porter, E. V., & Lawrence, J. E., 791, Mar. 3, Centri- [fugal pumps.
——— G., 430, Feb. 4, Gas-burners.
——— W. M., & Mulholland, J. R. T., 647, Feb. 22, [Carding engines.
Potter, E. P., 658, Feb. 23, Concentrating acids.
Potts, J. C., & Darnell, D. C. W., 272, Jan. 23, Venti- [lating water closets, &c.
Pounsett, R., 447, Feb. 5, Vinegar.
Powell, R. (Clark), 2997, Aug. 26 (*App.* 9.) Iron ships.
Powleson, W. L., 2565, July 17, (*App.* 4.) Steam super- [heaters.
Preyardon, J. (Hessel), 1636, May 3 (*App.* 45.) Steam- [boilers.
Price, H., 639, Feb. 22 (*App.* 35.) Oil lamps.
Puente, S., 436, Feb. 5. Sheep shear.
Pye, R., 70, Jan. 8, Shuttle springs.
Pzillas, R., & Kohrig, R. (Bousfield), 2486, July 10 [(*App.* 3.) Sugar.

Q.

Queen, J. W., & Co. (Beck), 689, Feb. 25, Prism for [spectroscopic and other purposes.
Quick, J., & Bestler, J. W., 696, Feb. 25, Swing bridges.

R.

Ramsay, F. (*Lowe*), 1956, May 22 (*App.* 48.) Sail hank [or shackle.
Ramsden, J. C., 221, Jan. 20, Driving band.
Rath, F., & Scantlebury, W., 232, Jan. 21. Creased or [plaited fabrics.
Rawsthorne, T., & Monk, W., 435, Feb. 5, Carding en- [gine rollers.
Read, W., 379, Feb. 2, Buttons; attaching same.
Reckendorfer, J. (Marler), 215, Jan. 20, Pencil cases.
Redfern, T., Smith, P., & Law, J. H., 431, Feb. 5. Paper [making.
Redheffer, W. (Benson), 388, Feb. 3, Freezing, churn- [ing, &c.
Redman, T. B., & Siggery, E. C., 273, Jan. 23, Couplings.

Reed, A., & Mulligan, B. T. (Clark), 115, Jan. 12, Knit-
[ting hats.
Rees, E., & Gardner, S., 320, Jan. 28, Fire-bars.
Reeves, T., 424, Feb. 4, Sewing-machines.
Reid, W., 166, Jan. 15, Sewing machines.
Rendel, A. M., 697, Feb. 25, Swing bridges.
Rennie, J., Sutherland, J., & Munn, A., 419, Feb. 4,
[Sinking cylinders for foundations.
Restler, J. W., & Quick, J., 696, Feb. 25, Meters.
Reynolds, F. S., & Brierley, W. W., J., & F. W., 201,
[Jan. 19, Railway signals and points.
——— F. W., 709, Feb. 26, Saw benches.
——— G. H., 2287, June 23 (*App.* 52) Rock-drilling
[machines.
——— O., 724, Feb. 27, Obtaining motive power, &c.
——— W. F., 319, Jan. 27, Ships' logs.
Rhodes, B. & T. B., 16, Jan. 1, Flocking fabrics.
——— T. B. & B., 16, Jan. 1, Flocking fabrics.
Richards, A. C. (Bonneville), 2649, July 26 (*App.* 5.)
[Type-setting machines.
Richards, J. M. (*Packer*), 739, Mar. 1, Artificial fuel.
Richardson, J., & Ball, C. J., 564, Feb. 16, Combined
[engine, &c., and air compressor.
Richmond, T., & Catlow, C., 32, Jan. 4, Looms.
Rideal, S., 113, Jan. 12, Lattice framework covering for
[floors, &c.
Rider, F. W., & Hutchence, H., 383, Feb. 2, Harmo-
[niums, organs, &c.
Rigby, J., & Scott, W. M., 312, Jan. 27, Fire-arms.
Rimington, J. McN., Shepherd, E., Rothwell, F. & T., &
[Hough, J. E., 350, Jan. 29, Sewing machines.
Roberts, A. & G., 636, Feb. 20, Pianofortes.
——— G. & A., 636, Feb. 20, Pianofortes.
——— T., 585, Feb. 18, Ships.
——— W. A., & Tantum, A. J., 443, Feb. 5, Work-
[ing sewing-machines.
Robinson, C. E. (Clark), 338, Jan. 28, Feeding and
[burning oils in furnaces.
Robinson, G. A., & Kendall, W. J., 588, Feb. 18, Castors.
——— R. C., 795, Mar. 4 (*App.* 9.) Clay pipes.
Rochow, F., & Matthiessen, F. O. (Clark), 1810, May 14
[(*App.* 46.) Hydraulic engines, &c.
Rogé, H. N., Poret, E., Baffoy P. H., & Dupré, P. S. E.
[(Clark), 288, Jan. 25, Preserving woven fabrics.
Rogers, B. W., 300, Jan. 26, Screws, bolts, &c.
——— G. P., & Vosper, C. W., 251, Jan. 22, Sewing
[machines, &c.
Rogers, H. (*Mullholland*), 161, Jan. 15, Cut nails.
——— J., 598, Feb. 18, Water columns.
Rogers, W. (Lake), 2045, June 3 (*App.* 49.) Smelting
[ores; making iron; furnaces.
Rolin, I. C. C., & Guitard, L. J. (Sauvée), 21, Jan. 2,
[Self-acting regulator for twisting machines.
Romanes, J., 716, Feb. 26, Roller skates.
Rood, G. A., & Hallett, B., 630, Feb. 20, Bicycles.
Ross, O. C. D., 197, Jan. 19, Utilizing petroleum as fuel.
Rothwell, F. & T., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
——— T. & F., Hough, J. E., Rimington, J. McN., &
[Shepherd, E., 350, Jan. 29, Sewing machines.
Rousseau, D. (Clark), 2657, July 27 (*App.* 5.) Railway
[signalling.
——— *D.* (Clark), 2740, Aug. 4 (*App.* 6.) Railway
[signalling.
Rowland, E., 94, Jan. 11, Compressing air; raising and
[forcing liquids, &c.
Rowley, J., 97, Jan. 11, Boot shield to prevent splashing.
——— S. H., 649, Feb. 22, Waterclosets.
Rudkin, T., & Peacock, J. C., 590, Feb. 18, Cooking, &c.
Russell, H., 109, Jan. 12, Registering garments, &c.
[sent to laundries.
——— J., & Dominy, G., 398, Feb. 3, Guards for carv-
[ing forks.
Russell, J. (Lake), 48, Jan. 5, Horse-shoes.
Russell, W., 1445, Apr. 21 (*App.* 9.) Metal furnaces.
Rutherford, J. H., & Fisher, H., 56, Jan. 6, Hot-air
[engines, &c.
Ruthven, W., 587, Feb. 18, Fire-lighters.
Rydill, G., 150, Jan. 14, Purifying sewage, &c.
——— G., 399, Feb. 3, Purifying sewage, &c.

S.

Sainty, J., 708, Feb. 26, Dressing and drying corn & seeds.
Salmon, J., & Crosland, W., 581, Feb. 17, Grinding and
[polishing stones.
Sanders, J. H., 330, Jan. 28, Cartridge cases and per-
[cussion caps.
Sauvée, A. (*Rolin & Guitard*), 21, Jan. 2, Self-acting
[regulator for twisting machines.
——— A. (*Faure & Kessler*), 2897, Aug. 17 (*App.* 8.)
[Sulphuric acid.
Savage, W. P., 271, Jan. 23, Preventing accidents on
[railways.
Sawyer, F. A., & Keene, G. A. (Haseltine), 700, Feb. 25,
[Surfaces for steps, &c.
Scantlebury, W., & Rath, F., 232, Jan. 21, Creased or
[plaited fabrics.
Schnabel & Henning (Brunner), 505, Feb. 11, Portable
[cranes.
Schofield, C. J., 511, Feb. 11, Furnaces.
Schrebler, G., 477, Feb. 9, Pistons.
Schulte, A. (Vollmer), 460, Feb. 6, Copying ink pencil.
Schultz, A. (Holliday), 498, Feb. 10, Printing fabrics.
——— *A.* (Holliday), 499, Feb. 10, Bleaching fabrics.
Schulz, J. J., & Clay, T., 701, Feb. 25, Tension mechanism
[for warp beams.
Schwanck, C. F., 618, Feb. 20, Elastic sprink hook.
Scott, F. (Cranston), 677, Feb. 24, Portable lathes for
[dentists and jewellers.
Scott, G., 128, Jan. 13, Glass furnaces.
——— H. Y. D., 135, Jan. 13, Purifying gas.
——— H. Y. D., 373, Feb. 1, Manures.
——— J. (*Gerard*), 38, Jan. 4, Finishing fabrics, &c.
——— J. C., 170, Jan. 15, Moulding toothed wheels, &c.
——— J. P. (*Haag*), 236, Jan. 21, Heating railway
[carriages.
Scott, R., 617, Feb. 19, Fabrics made in twist lace ma-
[chines.
——— W. M., 186, Jan. 18, Fire-arms.
——— W. M., & Rigby, J., 312, Jan. 27, Fire-arms.
Scully, J., & Lloyd, J., 226, Jan. 20, Drying wall papers, &c.
Seaman, R., & Shepard, H. W. (Lake), 761, Mar. 2,
[Regulating flow of gas, &c.
Searle, R., 774, Mar. 3, Rails for roads, &c.
Seccombe, J., & Talling, R., 562, Feb. 16, Preventing
[radiation of heat from steam-boilers.
Sellars, J. C., 112, Jan. 12, Cement.
Serrière, J., 242, Jan. 21, Furnaces.
Sewing-Machine Co., Hamburg-American (Jensen), 26,
[Jan. 2, Printing metals.
Shand, G., 213, Jan. 20, Maturing spirits, wines, &c.
Shanks, F., 1507, Apr. 23 (*App.* 43.) Carriages.
——— H., 725, Feb. 27, Winding or spooling threads, &c.
Shann, G., 458, Feb. 1, Steam traps.
Share, H. H., & Calley, S., 377, Feb. 2, Raising, &c., boats.
Shaw, B., Crabtree, T., & Woodhead, W., 740, Mar. 1, Looms.
——— E., 546, Feb. 15, Wheels.
——— J., 368, Feb. 1, Steam-boilers.
——— J. W., 543, Feb. 15, Cutting off steam in steam
[engine cylinders.
Shaw, T. (Justice), 793, Mar. 3, Valves.
Shedd, J. H., & Jenks, S. A. (Lake), 3070, Sep. 1
[(*App.* 10.) Liquid meters, pumps, motor engines.

Thompson, E., 180, Jan. 16, Rafts and ships' boats.
———— N., 756, Mar. 2, Stoppers for bottles, &c.
Thomson, W., 603, Feb. 19, Lithographic and type-
[printing machines.
Thornley, G., & Buxton, T., 188, Jan. 18, Casks.
———— G., & Buxton, T., 1518, Apr. 26 (*App.* 44.)
[Jointing cask staves.
Tildesley, M., 8, Jan. 1, Door bolts.
Tilley, W., 635, Feb. 20, Photography.
Timmis, I. A., & Granville, A., 643, Feb. 22, Treating
[hides, skins, &c.
Todd, L. J., 355, Jan. 30, Locomotive carriages, &c.
Tomkins, A. S., 114, Jan. 12, Cooking stoves.
Tomlinson, J., 401, Feb. 3, Preparing fibres.
Tomlinson, O. (North), 130, Jan. 13, Axle-boxes.
Topp, A. & N., & Nicholson, E., 283, Jan. 25, Carding
[engines.
—— N. & A., & Nicholson, E., 283, Jan. 25, Carding
[engines.
Toppan, D. L., Chapin, G. B., & Meloon, D. C. & H. H.
[(Haseltine), 1009, Mar. 18 (*App.* 38.) Wood-
[planing machines.
Toppin, P., & Longsdon, D., 176, Jan. 16, Horse-shoes.
Torr, C. W., & Atkins, J., 594, Feb. 18, Gasaliers, chan-
[deliers, &c.
Tournier, F. A. (Imray), 212, Jan. 20, Masticating,
[&c. food.
Tower, B., Deverell, W. T., & *Deverell, S. R.*, 308, Jan. 27,
[Motive-power.
Trabue, W., 661, Feb. 23, Needles.
Trotman, S., 715, Feb. 26, Generating and inflaming
[gaseous vapor.
Trottier, E., 488, Feb. 10, Removing grease from tin and
[terne plates.
Tucker, T. M., & Lowerre, A. H. (Johnson), 85, Jan. 9,
[Goffering, &c.
Turner, A., 154, Jan. 14, Elastic fabrics.
———— C., 426, Feb. 4, Coupling broken shafts.
———— C., & Page, H., 778, Mar. 3, Removing hair
[from hides, &c.
———— C. H., 545, Feb. 15, Curing smoky chimneys.
———— C. H., & Jeyes, J., 205, Jan. 19, Lubricator.
———— J., & Hughes, S., 392, Feb. 3, Lamp burners.
Turnock, J., 51, Jan. 5, Steam-engines.
Tyer, E., 449, Feb. 6, Galvanic batteries.

U.

Ure, A., 456, Feb. 6, Smelting ores.

V.

Vallet, L., 490, Feb. 10, Bottle stoppers.
Valpy, H., & Burrell, P., 275, Jan. 25, Railway car-
[riages; tyres.
Van Gelder, P., 732, Removing smut from wheat, &c.
Van Haagen, C. (Johnson), 47, Jan. 5, Sharpening drills.
Varley, C. F., 303, Jan. 27, Propeller shafts, &c.
———— F. H., 276, Jan. 25, Propeller shafts, &c.
Vaughan, E. P. H. (*Blot*), 37, Jan. 4, Presses.
———— E. P. H. (*Maynard*), 1003, Mar. 18 (*App.* 4.)
[Applying oil painting to walls, &c.
Vera, P., 175, Jan. 16, Gas or hot-air engines.
Verdier., F R. (Morgan-Brown), 654, Feb. 23, Treating
[peat.
Vere, C. E. Hope-, 183, Jan. 18, Cleansing china and
[other articles.
Vicars, T. & T., & Smith, J., 529, Feb. 13, Furnaces, &c.
Viglino, J., & Donna, J. (Morgan-Brown), 626, Feb. 20,
[Motive-power engines.
———— *J., & Donna, J.* (Morgan-Brown), 729, Feb. 27,
[Railway wheels.
Vigné, W. (Weatherdon), 107, Jan. 12, Disinfectant.
Vollmer, H. (*Schulte*), 460, Feb. 6, Copying ink pencils.
Von Faber, J. L., 178, Jan. 16, Pencils.
Vosper, C. W., & Rogers, G. P., 251, Jan. 22, Sewing
[machines, &c.

W.

Wackett, J., 68, Jan. 7, Slaughtering animals.
Wadsworth, James, & Edmoudson, J., 657, Feb. 23, Nails.
Wadsworth, John, 418, Feb. 4, Bottle stoppers.
Wakefield, J., 1282, Apr. 8 (*App.* 10.) Slide valves.
Walbank, J., & Bradley, J., 389, Feb. 3, Spinning.
Walker, B., & Pflaum, J. F. A., 719, Feb. 26, Hydraulic
[machinery.
———— E., & Whetten, W. H., 667, Feb. 23, Propelling
[ships.
———— R., & Shone, C. G., Feb. 15, Communicating in trains.
———— R. S., 733, Feb. 27, Steam boilers.
———— S., Gibson, J., & Howitt, T., 103, Jan. 12,
[Stoppering bottles, &c.
———— T., 762, Mar. 2, Fastener for cravats, &c.
Walkington, W., 541, Feb. 13, Wheel or roller skates.
Waller, G., 184, Jan. 18, Gas.
Walton, T., 299, Jan. 26, Locks.
Ward, S., & Lœwenstein, D., 78, Jan. 8, Doubling, &c.
[threads; stop motions.
Warren, F. P., Brodie, W., Wilson, M., & McLay, J. C. S.,
[76, Jan. 8, Railway wheels and axles.
Warschawsky, J., & Zysell, F., 347, Jan. 29, Pressing
[or ironing.
Warwick, J., 710, Feb. 26, Sewing-machines.
Watkins, D., & Harrington, J., 759, Mar. 2, Roller skates.
Waugh, J., 15, Jan. 1, Closing and opening bottles.
Wavish, J., 39, Jan. 4, Fire-places.
Way, J. T., 686, Feb. 24, Soluble phosphates of lime.
Weare, R., 252, Jan. 22, Extinguishing fire in ships, &c.
———— R., & Isherwood, S., 326, Jan. 28, Carbonaceous
[material for filtering, &c.
Weatherby, C. P. N., 351, Jan. 29, Ice; cooling buildings, &c.
Weatherdon, B. F. (*Vigné*), 107, Jan. 12, Disinfectant.
Webb, F. W., 462, Feb. 6, Railway points and signals.
—— J., & Leach, R., 257, Jan. 22, Embroidering.
Weber, C. P., & Portait, E. P. E. (Clark), 28, Jan. 2.
[Preparing fibres for spinning.
Webster, L., 459, Feb. 6, Fulling fabrics.
Weill, L., & Harburg, H. (*Grosclaude*), 528, Feb. 12,
[Musical boxes, &c.
Weldon, C. J., 77, Jan. 8, Clasps or buckles.
Wertheim, J. (Wirth), 637, Feb. 20, Ship furnitures.
Westerby, J., & Broadbent, T., 231, Jan. 21, Valves.
Westinghouse, G. (King), 569, Feb. 17, Motive-power
[engines.
Westwood, J., & Baillie, R., 341, Jan. 29, Corrugated
[iron plates.
Wetton, C. E., 359, Jan. 30, Boots and shoes.
Wheeler, W. F., 1592, Apr. 30 (*App.* 44.) Device for
[holding fertilizers, &c.
Whettem, W. H., & Walker, E., 667, Feb. 23, Propelling
[ships.
Whipple, H. O. (Ladd), 621, Feb. 20, Healds for looms.
Whitburn, T., 605, Feb. 19, Printing designs, &c. on
[wood.
White, J., 746, Mar. 1, Chromates of potash and soda.
Whitehouse, W., 596, Feb. 18, Sustaining artificial teeth
[in the mouth.
Whitelaw, A.. 641, Feb. 22, Lock for tip carts.

Whittaker, T., Duxbury, J., & Clayton, J., 73, Jan. 8,
[Bricks, tiles, &c.
Whittemore, A. **(Lake), 163, Jan. 15, Spikes.**
Whyte, A. C., 487, Feb. 10, Saving life from shipwreck.
——— J., 784, Mar. 3, Looms.
Wicks, J. F. **(Benson), 1139, Mar. 30 (*App.* 7.) Looms.**
——— *J. F.* (Benson), 1199, Apr. 2 (*App.* 40.) Pattern
[chains for looms.
Wier, M. A , 504, Feb. 11, Measuring flow of liquids.
Wigg, C., & Kennedy, J., 314, Jan. 27, Furnaces.
Wigham, J. R., 356, Jan. 30, Fog and other signals.
Wilcke, H., 4, Jan. 1, Propelling screw steam ships.
Wilcox, M., 406, Feb. 3, Combined seal and watch key.
Wilkin, F., & Deneef, J. **(Lake), 843, Mar. 6 (*App.* 10.)**
[Beds or couches.
Wilkinson, A., 60, Jan. 6, Compounds for paving, fuel,&c.
——— J. F., 380, Feb. 2, Obtaining motive-power.
Willans, J. G., 157, Jan. 14, Furnaces.
Williams, H., & Evans, P., 22, Jan. 2, Stoppering bottles.
Williams, I. F. **(Benson), 437, Feb. 5, Boots and lasts.**
Williamson, C., 82, Jan. 9, Stays and corsets.
——— W. B., 602, Feb. 18, Preventing pollution of
[rivers, &c.
Willis, J., 298, Jan. 26, Umbrellas and sunshades.
Wilmart, O. J., 1085, Mar. 24 (*App.* 39.) Welding wrought
[iron and steel
Wilson, A. **(Lake), 2234, June 17 (*App.* 51.) Steam-boiler**
valves.
Wilson, M., McLay, J. C. S., Warren, F. P., & Brodie, W.,
[76, Jan. 8, Railway wheels and axles.
——— T. W., 474, Feb. 8, Cleaning bottles.
——— W., & Battersby, J., 375, Feb. 2, Cutting and
[pulping roots.
Winchester, E. S., & Phelps, H. W. **(Haseltine), 485,**
[Feb. 9, Rock drills.
Winder, R., 74, Jan. 8, Distributing type.
Wirth, F. (*Emmerich*), 193, Jan. 18, Fire-arms.
——— F. (*Leiter*), 296, Jan. 26, Electric apparatus.
——— F. (*Knaust*), 439, Feb. 5, Valves.
Wirth, F. (*Wertheim*), 637, Feb. 20, Ship furnitures.
——— F. (*Knaust*), 678, Feb. 24, Stop valves.
——— F. (*Kuhlmann*), 679, Feb. 24, Pegging boots.
——— F. (*Neuss*), 705, Feb. 25, Needle machines.
Wise, W. L. (*Levet*), 3, Jan. 1, Boring rock, &c.
——— W. L. (*Masui*), 792, Mar. 3, Electric railway breaks.
——— W. L. (*Solvay*), 820, Mar. 5 (*App.* 9.) Washing
[gas, &c. ; distilling liquids.
——— W. L. (*Kay*), 1461, Apr. 21 (*App.* 43.) Knot-tying
[apparatus.
Wollaston, C. J., 58, Jan. 6, Thermo-electric apparatus.
Wolstencroft, E., 631, Feb. 20, Temples for looms.
Wolverson, E., 763, Mar. 2, Corkscrews, augers, screw
[drivers, &c.
Wood, G. R., 508, Feb. 11, Furnaces.
Woodhead, W., Shaw, B., & Crabtree, T., 740, Mar. 1,
[Looms.
Woodward, H. F., 551, Feb. 15, Overalls.
Worrall, A. J. & J., 189, Jan. 18, Shaping and cutting wire.
——— J. & A. J., 189, Jan. 18, Shaping and cutting wire.
——— S., 640, Feb. 22, Drawing card pins.
Wright, E., 754, Mar. 2, Transmitting and controlling
[motion.
——— M., & Pollard, J., 133, Jan. 13, Driving spindles.
Wyrill, M. B , 648, Feb. 22, Preparing and combing
[fibrous substances.

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Young, Mc C. **(Haseltine), 1317, Apr. 10 (*App.* 42.)**
[Cutting match splints.

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Zimmermann, J. F., 95, Jan. 11, Candle holders.
Zysell, F., & Warschawsky, J., 347, Jan. 29, Pressing or
[ironing.

Blowing engines; fans:
Fans for drying yarns in sizing, &c. machines, Lancaster, 250.
Air compressing or blowing engine, Stevenson, 387.
Actuating ventilating fans, Richardson & Ball, 564.
Fans, Reynolds, 724.
Rotary air blower for furnaces, &c., Patrick, 2499 (*App.* 3.)

Boas. *See* Muffs.

Boats (lowering, &c.). *See* Ships' boats.

Bobbins, spools and reels:
Compressing yarns in or on pirns, cops and bobbins, Cox, 642.
Yarn bobbins, Freir & Fairlie, 773.
Making thread spools or reels, Haseltine (*Lyman*), 1781 (*App.* 46.)

Boilers (miscellaneous):
Water circulator for coppers and other, Collier & Holding, 19.
For hot-water apparatus and other uses, Ormson, 317.
Supplementary water heater for kitchen, Smith, 520.
Safety valve and draw-off cock for domestic, Bailey, 539.
Stills for obtaining saccharine solutions, Manbré, 579.
For gas cooking apparatus, Peacock & Rudkin, 590.
Stove or fire-place for heating, Crichley, 859 (*App.* 10.)

Boilers (steam-engine). *See* Steam-boilers.

Bolts and door fasteners. *See* Locks.

Bolts and pins:
Locking-nuts of screw, Cunliffe, 238.
Feeding blanks for turning, worming, &c., Rogers, 300.
Securing nuts on through, of rock drills, Reynolds, 2287 (*App.* 52.)

Bone and ivory:
Lathes for bone and ivory workers, Howarth & Howarth, 322.
Cutting, slicing, reducing, and pulverising, Bradford, 727.
Cutting or carving in ivory, Notton, 743.

Bone black. *See* Charcoal.

Books:
Pocket book fastening, Pendleton, 337.
Adjustable stand for holding, Bell, 565.

Boots and shoes:
Attaching buttons to, Bousfield (*Heaton*), 18.
Fastening or attaching buttons to, Feldman, 88.
Guards or shields for, to prevent splashing, Rowley, 97.
Applying guards to goloshes and clogs, Rowley, 97.
Fastenings for, Jenkinson, 98.
Shaping, channelling & feathering soles, Gardner (*Blake*), 208.
Templates for cutting, &c. soles, Gardner (*Blake*), 206.
Machine for blocking the uppers of, Nardi, 216.
Last and stretching apparatus for, Cramp, 225.
Combined lace-boot, legging and gaiter, Kerby, 274.
Making, to impart heat, electricity, &c. to feet, Wetton, 359.
Attaching buttons to, Read, 379.
Household "help" for cleaning, Lake (*Bogle*), 395.
Rubber or elastic, and lasts for same, Benson (*Williams*), 437.
Clips, slides, or fastenings for, Jones, 595.
Cutting leather, &c. for stiffeners, Lake (*Boivin*), 615.
Nails for, Edmondson & Wadsworth, 657.
Pegging machines, Wirth (*Kuhlmann*), 679.
Nails for; hole making tool for same, Derigny & Tallon, 717.
Artificial leather or cloth for, Block, 718.

Boring and drilling metals:
Drilling out the body of rivets, Lake (*Bray*), 100.
Rails, cylinders, valves, columns, pipes, &c., Enoch, 190.
Reamer for, Mills (*Siprell*), 246.
Boiler and other shell drilling machines, Allan, 297.

Boring and drilling rock or stone:
Rotating drilling or boring tool, Wise (*Levet*), 3.
Operating valves of machines for, Wise (*Levet*), 3.
Rotary machinery for cutting or, Gay, 160.
Rock reamers for use in blasting, Mills (*Siprell*), 246.
Saws for percussive rock drills, Payton & Holmes, 343.
Compressing air for working rock drills, Stevenson, 387.
Rock drill engine, Haseltine (*Winchester & Phelps*), 485.
Actuating rock drills, Richardson & Ball, 564.
Percussive machine for; tripod stand, Ellis, 900 (*App.* 10.)
Operating drill pistons without valves, Reynolds, 2287 (*App.* 52.)
Percussive rock drills and legs for same, Reynolds, 2287 (*App.* 52.)

Boring and drilling wood:
Treadle-apparatus for operating drills, Clark (*Dows*), 544.
Holes in thread spools or reels, Haseltine (*Lyman*), 1781 (*App.* 46.)

Bottle stoppers:
Closing bottles containing gaseous liquids, Waugh, 15.
External, for soda-water, &c., Evans & Williams, 22.
Internal elongated, for gaseous liquids, Bowman, 53.
Tap, fitted in neck of bottle, Howitt & others, 105.
Plug or tap stopper for aërated liquids, Jones & Davies,
Internal, for aërated and other liquids, Aylesbury, 262.
Internal pipe clay, for aërated waters, Wadsworth, 418.
Corking apparatus, Haseltine (*Bradford & Ferry*), 484.
Internal, for aërated or gaseous liquids, Vallet, 490.
Instrument for placing washers in position, Vallet, 490.
Closing bottles containing soda-water, &c., Howat, 583.
With sliding wing pieces and removing same, Thompson,
Internal stopper and bottle combined, Tallis & Cave, 788.
India rubber caps for feeding or other bottles, Parr,
[(*App.*

Bottles; decanters; bottling and decanting:
Instrument for opening internal stoppered, Waugh, 15.
Rings or heads of, for gaseous waters, Bowman, 53.
Tap for filling and emptying, Howitt & others, 105.
Cleansing decanters and other bottles, Hope-Vere, 185.
Supplying carbonic acid gas to, Gillman & Spencer, 234.
Bottling beer charged with gas, Gillman & Spencer, 234.
Making aperture and fitting tap in, Jones & Davies, 258.
Substitute for carboys, for storing, &c. chemicals, Weare,
Bidons and drinking bottles or flasks, Pieri & Smith, 342.
Cleansing or washing, Wilson, 474.
Filling and corking, Haseltine (*Bradford & Ferry*), 484.
Bottling aërated or gaseous liquids, Vallet, 490.
Instrument for opening internal stoppered, Vallet, 490.
Filling, with soda-water, &c., & drawing of same, Howat,
For aërated liquids, &c., and filling same, Tallis & Cave,

Boxes and cases:
Paper material for making, Gandy, 52.
Cases for vessels holding liquids, Gee, 111.
Cartridge boxes, Lee, 131.
For shipping minerals, Connell, 302.
Metallic, for holding pens and small articles, Myers,
Suspending, for damageable goods, in equipoise, Chomel,
Employing metallic cases for packing hops, Tebbs, 692.
For tooth, plate, and such like powders, Harrison, 749.
Coverings for tea chests, Lipman, 781.
Paper, Haseltine (*Cleveland Paper-box Machine Co.*),
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Braces or suspenders:
Buckle or clasp for, Weldon, 77.
Fastening for, Pendleton, 337.

Bread and biscuits:
Ingredients for making, Johnson (*Huyttens*), 445.
Aerotherm portable oven, Bonneville (*Lesobre*), 1937 (*App.*

Breakers or watercasks. *See* Casks.

Breaks for machinery:
For hydraulic lifts when lowering, Casson, 123.
For warehouse hoists or cranes, Barker, 452.
For sewing and other light machinery, Clark (*Dows*), 544.
Wheel & wedge device for arresting motion, &c., Wright,

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Continuous, with shoes for pressing on rails, Foster, 19.
Arranging and operating continuous railway, Clark, 30.
Automatic, for perambulators, Staniland, 134.
Continuous, with shoes, &c. pressing on rails, Joliot, 204.
Working continuous railway, Savage, 271.
Working automatic railway, Burdess, 329.
Actuating pneumatic railway, Steel, 333.
Coupling and working continuous railway, Temple, 391.
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Diminishing friction in screw railway, Olpherts, 560.
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Wheel and wedge device, Wright, 754.
Electric railway, Wise (*Masui*), 792.
Variable pressure automatic, Alexander (*Barker*), 1433 (*App.*
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Breakwaters; sea-walls:
Compound material for & forming sea & river walls, Pope,

Breech-loading fire-arms. *See* Fire-arms.

Brewing:
Maturing, &c. malt liquors by sunlight, Shand, 213.
Treating and maturing beer, Gillman & Spencer, 234.
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[(*Shepard & Seaman*), 761.
nd regulating flow of liquids in, Gooch, 775.
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Calendars or almanacs :
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Camp and field equipage :
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Cams :
For working hammers in making untapped nuts, Marsden, 177.
For sewing-machines, Vosper & Rogers, 251.
For boot and shoe pegging machines, Wirth (*Kuhlmann*), 679.
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Candles ; candlesticks ; night-lights :
Candle holders for candlesticks, &c., Zimmermann, 95.
Machine for making paper wicks, Aspinwall, 249.
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Carburetting :
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Cards :
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Carpets :
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Carriages, carts and waggons (road) :
Wheel guard or safety apparatus for, Bois, 45.
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Keeping dog cart bodies, &c. horizontal, Osmond, 547.
Spiral bearing springs for, Byron (*Godley*), 550.
Loading, with grain, salt, &c. on quays, Goodwin, 559.
Lock for tip-carts, Whitelaw, 641.
Steps and shaft plates for, Haseltine, (*Keene & Sawyer*), 700.
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Locking or turning round gear for drags, &c., Shanks, 1507
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Cartridges and holders :
Forming cases of metallic, Brookes (*Hobbs & Orcutt*), 125.
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Making cases out of steel coated with metals, Sanders, 330.
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Casks:
For carrying petroleum, &c., Sinibaldi (*Sinibaldi*), 136.
Preparing and cutting staves for, Thornley & Buxton, 188.
Filling with beer & carbonic acid gas, Gillman & Spencer, 234.
Splaying and bending hoops for, Bradshaw, 364.
Constructing boats' breakers of iron, Dignum, 515.
Kegs, for explosive compounds, Chambers, 682.
Regulator for charging liquids with gas in, Lake (*Shepard & [Seaman*), 761.
Edging and centring wood staves for, Thornley & Buxton, 1518 [(*App.* 44.)

Casters:
Combined ball and roller, Kendall & Robinson, 588.
Ball and wheel for furniture, &c., Edwards (*Crist*), 748.

Casting and moulding metals:
Or uniting parts of hammers, Hughes (*Parker*), 60.
Inscribed plates in lieu of engraving, Mallet, 144.
Moulds for, inscribed plates or surfaces, Mallet, 144.
Toothed wheels and other circular articles, Scott, 170.
Substitute for moulding sand, from slag, Luckenbach, 243.
Links for chains or cables, Handyside, 376.
Internal stoppers for aërated liquid bottles, Vallet, 490.
Clips, slides, or fastenings for boots, shoes, &c., Jones, 595.
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Cattle (conveying on board ship):
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Cellars:
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Cement:
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Chaff-cutters:
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Chains; chain cables:
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Charcoal:
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Cheques and drafts:
Detachable limit or value stamps for, Cooper, 728.

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Chlorine and chlorides:
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Cisterns; tanks; reservoirs:
Material for packing joints of tanks, Fish, 9.
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For filtering sewage and polluted waters, Rydill, 150.
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Clocks; watches; time-keepers:
Bearings for vertical shafts of turret, Collingwood, 79.
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Watch protector, for fitting in vest pocket, Maclaren, 415.
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Composition for making watch-stands, Cole, 495.
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Sliding, for knitting machines, Clark (*Reed & Mulligan*), 115.
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Coating and covering cylinders and rollers:
Used in preparing cotton, &c., Edwards (*Edwards*), 357.
Milling machine rollers, Webster, 459.

Coating cloth and fabrics:
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Fabrics with fur, Crosby (*Kellogg*), 324.

Coating metals:
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Steel plates for cartridge cases and caps, Sanders, 330.
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Cocks; taps; faucets:
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Taps for fitting to bottle necks, Howitt & others, 103.
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Cocoa:
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Coffee:
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Coffins:
Ornamenting coffin furniture and, Kendrick, 31.
Making, of wicker or basket work on wood frames, Kirby, 503.

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Confectionary:
Making ice-creams, fruit-ices, &c., Benson (*Redheffer*), 388.
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Cooking; culinary apparatus and utensils:
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Gas-ovens, gas-gridirons & boilers for, Peacock & Rudkin, 590.
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